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ABSTRACT

To support arguments for an integrative approach to the study of writing, this report summarizes past and current trends in writing research and the resulting implications. The introduction discusses pre-1970s, 1970s, and 1980s research trends, noting that current research focuses on the context in which writing takes place and points out the benefits of building a social cognitive theory of writing. The first section, containing a review of relevant research, begins with a section on the uses of writing, stressing the notion of "communicative competence" as the individual's knowledge of appropriate uses of language in varied social contexts. This section also looks at the direction of current research, literacy communities, and the evaluation of written language. The second section of the literature review examines the nature of writing, and includes information on current research trends, possible new directions in research and their implications, writing processes and products, the role of technology, and individual differences in composing strategies. The third section of the report examines the acquisition of writing skills, with subsections on current research trends, the connection between writing and learning, the role of adults and peers, computer responses to writing, and new directions in research. The final section of the report suggests areas for future research. Twenty-one pages of references are included. (JC)

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CENTER FOR THE STUDY OF WRITING

Technical Report No. 1

RESEARCH IN WRITING: PAST, PRESENT, AND FUTURE

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August, 1987

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RESEARCH IN WRITING: PAST, PRESENT, AND FUTURE[1]

By

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INTEGRATING RESEARCH ON WRITING

Written language allows us to come to know and understand our human nature, to chronicle our history and culture, to learn in all disciplines. The past twenty years have brought about dramatic changes in writing research--in the research questions asked, the approaches taken to answering those questions, and the kinds of implications drawn for teaching and learning.

Until the 1970s, most studies of writing were concerned with one or another aspect of the written *product*. Researchers, lacking a theory of how writing skills developed, compared the effectiveness of a variety of ad hoc instructional methods or concentrated on how best to evaluate the final product.

During the 1970s, the focus on product was replaced with a new concern for the writing *process*. A variety of factors contributed to this shift, including the discovery that good writing was more difficult to characterize than most people had assumed, a new awareness that growth in language skills was complex, and the recognition that any piece of writing had its own developmental history worthy of study in its own right.

During the 1980s, a third strand of writing research has been added: a concern with *context*--with approaches that look carefully at homes, classrooms, and workplaces as critical social contexts in which people learn to write in interaction with their peers and teachers. This work has shown how uses of and approaches to language differ among subcultures, among academic and nonacademic tasks, and across the functional uses to which writing is put. Researchers in this tradition have begun to show that writing is a functional ability that begins well before the school years as stories, messages, and greetings are drawn and written--and that ways in which young children approach writing are related to the language and literacy tasks to which they were exposed in their home and community environments. They also suggest that learning and instruction for people of all ages can only be understood within the complexities of the communicative environments in which those processes naturally occur.

Coinciding with changing concerns in the focus of writing research have been changing concerns about education itself. Recently there have been a number of calls for educational reform (e.g., Boyer, 1983; Commission on Excellence, 1983; Goodlad, 1984; Sizer, 1984; Stake & Easley, 1978). All emphasize the importance of writing instruction. Each report focuses on learning not only the mechanics of the "basic" conventions of

written language, but the uses of writing in creating a more thoughtful citizenry. Each sees writing as having a special role in the development of higher order thinking and reasoning abilities. Writing has become especially important today, as our society increases in technological complexity and as the demands for a literate citizenry increase. To be literate in today's society, students must learn not only how to manage the basics of writing (and reading) but also how to use what they already know to shape and rethink their ideas, to acquire new knowledge, and to communicate their ideas to others.

As we consider current social needs and look critically at our research history, we believe that two unproductive schisms have arisen. Studies of the writing process have become separated from studies of written products. And studies of classroom contexts are now in danger of becoming separated from studies of cognitive processes. We argue for an integrative approach to studying writing, an approach that integrates research on social context with research on cognition. The three inherited threads of research history (process, product, and context) should be used to form a cooperative multidisciplinary perspective that will, in its turn, lead to the building of a social-cognitive theory of writing.

BUILDING A SOCIAL-COGNITIVE THEORY

Building the integrated social-cognitive theory of writing that we envision means going beyond the insights of any given research paradigm or instructional system. It means attending to the connections between the powerful forces of cognition, context, and language. Such a theory will start with the recognition that all learning is socially based: teaching is ultimately an interactive process, cognition is influenced by context, and the goal of both writer and teacher is improved performance, however that is defined. Such an integrative theory calls, on the one hand, for a broad research agenda informed by the best current work in education, anthropology, psychology, rhetoric, linguistics, and other disciplines. On the other hand, such a theory will emerge only if we make intelligent decisions about the connections that matter most to writing and to learning.

We believe that future research should reflect decisions about what matters within this richly tangled web. The social contexts that are intricately interwoven with the development, the uses, and the teaching of writing leave their imprint on both the writer and the written product in many ways. Writers' strategic choices are a reflection of both their past writing experiences and their active interpretation of the ongoing one. Cognition and context interact in writers' understanding of the task before them, in the knowledge they bring to writing, and in the options they possess and entertain. In different populations, at different ages, in different situations, this interaction takes radically different forms. A social-cognitive theory will let us recognize the patterned variety, and plot courses that can lead to more effective teaching and learning for all writers.

Our concerns are, on the one hand, intensely practical: we are concerned with writing as a means of communication, as a skill to be developed in order to create the product we call good writing, and as a way to help students learn across the disciplines. On the other hand, the very nature of writing leads us to be equally concerned with it as a way people come to understand their world, both the intellectual world of school and the more private world of personal meaning. In the same way that readers construct meanings from the texts they read, based on the knowledge they bring to reading, writers construct meanings in the texts they write--meanings which are a

reflection of both the knowledge they bring to composing and the generative process of writing itself.

Let us be more specific about what this conception of writing as a social and cognitive process offers us, and what it asks us to develop. First of all, the research behind this conceptual shift should place instruction in writing squarely in its social context and help us see that learning to write is not simply skill acquisition, but is learning to enter into discourse communities which have their own rules and expectations. Most of us have to function in writing communities that range from the academic to the job-related to the social. In school settings, the implication is that students learn best when teachers treat (and students perceive) writing as a purposeful act. Creating this purposeful context is difficult, but most critical in teaching academic and other kinds of school-sponsored writing.

For example, in recognizing the social context for academic discourse, we are not only going to recover some of the powerful traditions of a rhetorical education--in which communication was tested in public debate--we are also going to recover the sense of academic discourse as communication within a community of critical thinkers. Our experience to date suggests that our students will also learn more quickly to write better when they too treat writing as a purposeful social act.

Second, the research behind this conceptual shift should also give us a radically expanded look at the intellectual, and to some extent the affective processes writers go through. We have come to understand that the cognitive processes of writers do not exist in the abstract but are, in fact, influenced by the goal and structure of the task to be accomplished, the social roles, shared history, and ongoing interactions of the people involved, and the wider social and cultural milieu. Treating writing as a process linking context and thinking will lead both teachers and researchers to articulate some of the dimensions of the instructional context that may support or hobble developing writers.

To begin to make the conceptual shift to a social-cognitive view of writing, a view that will wed context and cognition, we argue for research that considers both cognition and context and how the two interact.

REVIEW OF RELEVANT RESEARCH

We review research in three traditional categories: the uses of writing, the nature of writing, and the acquisition of writing. In each part of the review that follows, implications for future research will be discussed.

Part 1: The Uses of Writing

The complexity of writing is illustrated by the elusiveness of the term itself. For written language comes in many varieties, differing with respect to linguistic and cognitive properties, uses and functions, and ways of being evaluated. We cannot speak realistically of "writing" without giving consideration to its many forms, uses, and statuses.

Further, although a major aim of future research should be to contribute to effective writing instruction, writing cannot be thought of as simply one of the basic skills. Rather, writing is a social activity, and learning to write is a process of enculturation

into the social life of one's community, school, and workplace (Basso, 1974; Heath, 1982, 1983; Vygotsky, 1978).

Thus, we argue against a unidimensional view of writing and for a view that works toward identifying its linguistic, cognitive, and functional properties--locating these differences with reference to the roles writing plays in the social and organizational structure of communities, classrooms, and workplaces and investigating the factors relevant to the ways various types of writing are evaluated.

The concept of language as a tool which is sensitive to and instrumental in creating context arises primarily from sociolinguistic work on speech. Sociolinguists highlight language as a human activity. The concept of "humanness" introduces a multitude of complexities to linguistic study; for language, as a human phenomenon, is not an abstract fact but a dynamic event. Sociolinguists like Hymes (1972), Gumperz (1971), and Labov (1970) have studied the interrelationships between language variation, characteristics of speakers or groups of speakers, and social context: who says what, to whom, how, and when. Hymes's (1974) term "communicative competence" captures an individual's knowledge of appropriate uses of language in varied social contexts.

We have only recently begun to study written language from this perspective. In examining writing as a cultural tool (Vygotsky, 1978), researchers' efforts have been directed toward identifying the linguistic and cognitive properties of writing that mark its uniqueness as a tool, especially as distinct from speech, and toward understanding how culture has shaped, and been shaped by, writing for a wide variety of purposes (Chafe, 1982, in press-b; Cook-Gumperz & Gumperz, 1981; Goody, 1977; Goody & Watt, 1963; Heath, 1983; Lawton, 1968; Luria, 1976; Scribner & Cole, 1981).

This work has yielded appealing, powerful concepts. For example, calls for "purposeful writing activities" abound in the instructional literature. Yet at present we have very little systematic information on what constitutes "purposeful writing" for varied groups of people. This lack has occasionally been pointed out (Basso, 1974; Corbett, 1981; Szwed, 1981), but Heath's (1983) work on two communities in the Southeast is conspicuous as the only extensive study of writing types, uses, and functions. To grasp the range of writing tasks that individuals in varied environments must face in order to carry out their affairs, we need further research, not only on the community level, but concentrated as well on the discourse communities students face as they move from families and preschools to the elementary school, from the early elementary grades to the varied demands of the academic disciplines in the middle and later school years, and eventually into the workplace.

Our information on these varied discourse communities is limited. There has been some research on preschool children's involvement in literacy events, particularly in middle-class communities (Cochran-Smith, 1984; Taylor, 1983), but the literacy experiences of children from special-needs populations have been ignored (Teale, Estrada, & Anderson, 1981, and Heath, 1983, are exceptions). Further, despite much interest in the young child's transition into school, there is little documentation of the nature of varied classrooms as literacy communities--certainly not enough to create a typology of classroom contexts. How exactly does the classroom function as a social system (Florio & Clark, 1982)? What is the nature of literacy activities, including expected topics and forms, anticipated audiences, perceived evaluators and standards? Although we have some sense of what "effective" and "ineffective" classrooms are like (Graves, 1978, 1983), with a population as diverse as our own we need to understand the social and

cognitive dimensions of classroom activities and how children with different literacy backgrounds and understandings react to those activities. Only then will we understand the features we can manipulate as we work to create more comfortable and effective classrooms for all our students.

As students progress through school, classrooms exist not only as literacy communities in their own right, but also as avenues to the intellectual and social conventions of disciplinary communities (Applebee, 1982; Bazerman, 1981; Bizzell, 1982; Maimon et al., 1981; Odell, Goswami, & Quick, 1983). And, although there have been many calls for "writing across the curriculum" (e.g., Healy, 1981), there is little information on how these conventions are manifested in varied content area classrooms serving students with different degrees of expertise, not only in the content area, but in writing as well. There is a need to define not only how disciplines differ in the demands they make on students, but how students progressively become members of these communities--or why they choose not to become members (Labov, 1982; Ogbu, 1981).

Eventually, "students" are to become productive members of the workplace. As the movement from an industrial to an information society continues, students will find fewer and fewer openings for unskilled workers (Osterman, 1980; Strassmann, 1983). Simply saying that all students must be "functionally literate" to be successful is not sufficient, as functional literacy is a relative, not an absolute, phenomenon (Robinson, 1983); its presence depends upon the demands of the particular environment. Yet, research is just beginning to uncover the nature and function of writing in the workplace. The information now available focuses primarily on white-collar jobs (Herrington, 1985; one exception is Pfeffer's, 1981, police management project). We see a need, then, to investigate the crucial relationships between specific writing abilities and employment--the likelihood of one's being employed in the first place, but also one's potential for advancement. In addition, the effects which writing abilities may have on non-economic aspects of life must not be ignored. How do individuals make use of writing to improve the quality of their lives--socially, aesthetically, and in terms of self-fulfillment?

The limited information available on students' entry into these varied writing contexts makes clear the need to undertake systematic investigations of the nature, functions, and uses of writing across these contexts.

In addition to research directed at these questions, we see a need to particularize examinations of the social organization of writing in varied contexts with examinations of the subjective interpretation of that organization by individuals. For example, the work of Florio and Clark (1982) provides an analytic framework for describing the social structure of writing activities in classrooms (e.g., the range of writing uses, the initiators of writing activities, the audiences and formats, and so on). But, it does not allow us to see how those activities shape and are shaped by the performance of individual class members, particularly those who are differentially successful. Activities which on the surface meet criteria for "good" practice, such as free writing and sharing (Dyson, 1984a,b, 1985b) and class discussions (Freedman & Greenleaf, 1985), may in fact give rise to unanticipated and, perhaps, counter-productive behaviors because of how varied students interpret them. Further, the complexities of the peer network itself can change the nature of the behaviors a given activity elicits (Labov, 1982; see review article on academic tasks by Doyle, 1983).

Most analytic examinations of student performance within the organizational structure of the classroom have focused on the social and linguistic features that affect access to

learning (Cazden, 1986). These studies have illustrated that teachers' ability to instruct individual students and their assessment of what individual students know is dependent upon students' ability to participate appropriately in the interactional structure of classroom activities, including lessons (e.g., Au & Mason, 1981; Mehan, 1979; Philips, 1972). They have not, however, allowed us to see how the interactive nature of learning shapes what is in fact learned. We see a need to focus on *what* is learned simultaneously with studying *how* it is learned. As Erickson (1982) argues, when one is interested in the academic success of individuals, one must then focus on individual thought and action in the immediate learning environment, while not ignoring that that immediate environment is a part of the larger social and cultural environment that extends well beyond the walls of the classroom. We then should integrate information that we have gained about the social and linguistic features that affect students' access to learning with information about how students interpret and participate in the activity of writing and learning to write. We should investigate how learning environments are organized and presented to learners and how learners subjectively respond to those environments. Theoretical guidance for such work can be found in the writings of Vygotsky (1978) and in recent research extending his concepts (e.g., Brown, Palincsar, & Purcell, 1986; Rogoff & Lave, 1984; Wertsch, 1985).

In sum, we have argued for increased attention to detailing the demands of varied literacy communities, particularly at key transition points (entry into elementary and secondary school and into the workplace), melding concern with the nature, functions, and uses of writing in these environments with the subjective interpretation of them by individual learners, and, similarly, integrating our knowledge of the linguistic and social features of interaction with a concern for the ongoing processes of teaching and learning to write. In the next two sections of Part I, we first highlight the findings of research on varied literacy communities. Then, because of our concern with the ability of writers to function effectively in these communities, we discuss research on the evaluation of writing performance.

The Direction of Current Research

Literacy Communities. Like speech, writing is a cultural tool--a system passed on in society to help the members of that society carry on their lives together (Scribner & Cole, 1981). Goody (1968) discusses the unique contribution of writing to human cultures:

> The importance of writing lies in its creating a new medium of communication between men. Its essential service is to objectify speech, to provide language with a material correlative, a set of visible signs. In this material form, speech can be transmitted over space and preserved over time; what people say and think can be rescued from the transitoriness of oral communication. (pp. 1-2)

In the last decade anthropologists, linguists, and psychologists have considered how cultures have shaped and been shaped by writing for a wide variety of purposes (Goody, 1968; Goody & Watt, 1963; Heath, 1983; Olson, 1977; Philips, 1975). Prototypical written language is differentiated from oral language linguistically by such variables as relative lengths of units such as clauses, sentences, and paragraphs; frequencies of clause-expansion devices (e.g., prepositional phrases, nominalizations); types of subordination; topical coherence; and relative degrees of involvement with self, audience, and subject matter (Chafe, 1982, 1985a; Chafe & Danielewicz, in press; Johnston, 1979; Tannen, 1982, 1984a,b). The development of explicit and tightly structured prose is seen

as having had psychological consequences, leading to the development of abstract, logical reasoning (Goody & Watt, 1963; Olson, 1977).

There are, of course, varied styles of written language, just as there are varied styles of oral language. Recently the theory that the development of writing skill leads inevitably to the production of expository prose has been challenged. Ways of using both oral and written language are interrelated with ways of living--historical and geographical conditions; social and economic resources and opportunities; religious beliefs, values, and motivations (Heath, 1983). The consequences of written language for mental functioning depend upon the specific nature of the written language activities, including their goals and the cognitive processes they entail (Scribner & Cole, 1981). Studies of writing in varied communities have been called for in order to understand the ways they use oral and written language, both separately and cooperatively (Basso, 1974; Philips, 1975; Szwed, 1981).

Using techniques from the ethnography of communication, researchers are beginning to study the literacy events occurring in diverse settings. Literacy events are activities engaged in by one or more persons that are centered around reading or writing (Teale, Estrada, & Anderson, 1981), and that are governed by social rules about how participants use speech during the activity (Heath, 1982). Like speech events (Hymes, 1972), literacy events are characterized by varied components, including setting, participants (senders, recipients), purposes and goals, message form, content, channel, key or tone, and norms governing how interaction should occur (Basso, 1974). The most extensive ethnography has been Heath's (1983) study of language use in two working class communities and in the homes of middle-class teachers in the Piedmont Carolinas. Individuals in all three settings were literate, in that all made some use of written language, but only the middle-class community used written language--and talked about written language--in ways compatible with the narrative models used in school. Heath worked with teachers to develop strategies for making school ways of using and talking about written language sensible to students.

Similar examinations of other communities are not available. The work of Teale, Estrada, and Anderson (1981; Anderson & Stokes, 1984; Teale, 1986), however, suggests caution in making judgments about an individual's literacy experiences on the basis of such factors as ethnic background or education of parents. In their study of low-income Hispanic, Black, and Anglo families, there were many differences among homes with respect to the frequency and length of varied literacy activities. Complex social and institutional domains (parents' occupation, religion, entertainment preferences) were sources of those differences.

The findings of Teale, Estrada, and Anderson illustrate that a "literacy community" is not synonymous with a "cultural community." Just as speech communities (Gumperz, 1971) may be occupational or interest specific, so may literacy communities. In the following sections, we focus on two that are receiving particular attention in the education literature--the classroom and the workplace, both of which may have special ways of using and talking about written language.

Literacy in the Classroom Community. A classroom is a part of the larger sociocultural milieu, but it is also a small community, one with its own values, shared responsibilities, and evolving history (Florio & Clark, 1982). The concept of the classroom as a social system has been dramatized by ecological studies that began particularly in the fifties (Henry, 1955, 1963; Jackson, 1968; Leacock, 1969; Rist, 1970, 1973; see reviews by

Bogdan & Biklen, 1982, and Hamilton, 1983). Among the summary findings Hamilton cites from this body of work are that (a) competence as a student requires the ability to understand and participate in the complex system of classroom interaction as well as knowledge of subject matter; (b) distinctive activity structures encourage different types of interactions among students and teachers; (c) teachers' expectations of children based on their parents' social class establish a self-fulfilling prophecy; and (d) the prominence of peer social interaction in schools can displace the academic function of schools, especially at the high school level, but peer interaction can also serve to reinforce organizational academic norms (pp. 322, 326, 330).

Beginning in the seventies, researchers began to focus specifically on the language of the classroom arguing that it was, after all, through language that teaching and learning occurred and, thus, through language that insight could be gained into the social context of cognition (see review, Cazden, 1986). Operating in the tradition of sociolinguistics, particularly the ethnography of communication (Gumperz, 1971; Hymes, 1972), researchers first focused on how language was used in the classroom to create social barriers for non-mainstream children, barriers that were not inherent in the mental abilities of children nor in the academic content to be learned (Barnes, Britton, & Rosen, 1969; Cazden, John, & Hymes, 1972).

While more recent investigators have continued to document how patterns of school language use may deny children access to instruction (Au & Mason, 1981; Erickson & Mohatt, 1982; Michaels & Cook-Gumperz, 1979), others have focused on documenting teaching and learning as "linguistic processes" (Green, 1983), without specific attention to special-needs populations. In many ways, the findings of this research echo those cited earlier for ecological, but not necessarily linguistic, studies. Students are seen as learning to participate in classroom activities that demand both sociolinguistic and academic competence, as, through interaction, teachers and students construct varied teaching and learning contexts (e.g., Bremme & Erickson, 1977; Green & Wallat, 1979; Mehan, 1979; Merritt, 1982; Shultz & Florio, 1979; Sinclair & Coulthard, 1975; Wilkinson, 1982). The peer social network is described as interacting in complex ways with teaching and learning, at times supporting and, at other times, interfering; for example, peers have been found to be effective teachers and collaborative learners (Cooper, Marquis, & Ayers-Lopez, 1982; Newman, Griffin, & Cole, 1984; Steinberg & Cazden, 1979; Wilkinson, 1982). Instructional interaction may, in fact, influence that network, creating high- and low-status groups (Morine-Dershimer, 1983). This research, however, has yielded more fine-grained, more subtle analyses of the interactive nature of classrooms and, moreover, has emphasized the finely tuned collaboration between and among teachers and students that creates the ongoing process of schooling.

While much attention has been focused on speech events in classrooms, researchers are only beginning to study literacy events in classrooms. Many scholars have, of course, investigated how writing is used in various situations for various purposes. The study of literature and rhetoric has produced taxonomies of textual types (e.g., Kinneavy, 1971; Lundsford & Ede, 1984; Winterowd, 1975). Authors concerned with the teaching of writing have produced other categories (e.g., Britton et al., 1975; Emig, 1971). Working within the tradition of the ethnography of communication, researchers are interested in how the activity of writing is socially organized within the ongoing life of a particular group (Clark & Florio, 1981; Heath & Branscombe, 1985). This work, then, should eventually allow us insight into how classrooms create--or restrict--students' opportunities to learn.

For example, Florio and Clark (1982; Clark & Florio, 1982) examined the literacy events in a second/third-grade and a sixth-grade classroom. They developed an analytic framework that described the range of functions writing served throughout the school day and the features that distinguished types of writing events (e.g., initiators of writing, audiences, formats, evaluators). Fiering (1981) and Gilmore (1983), in contrast, were primarily interested in how students created their own opportunities to learn. They studied the unofficial (child-controlled) activities of intermediate-grade students in inner-city schools, noting that students who may be viewed as poor writers by their teachers may in fact make extensive use of writing for their own purposes.

Few researchers have studied how students interpret (rather than how they meet particular standards for) the writing opportunities available to them; only rarely have they followed students and events over time, investigating the sources of those interpretations. Nonetheless, the writing opportunities seemingly available to students from a teacher's or an observer's point of view may not, in fact, be realized in students' interpretations of those events. Students may differ in their social interpretations of the events (e.g., who, in fact, the audience is, what the actual purpose of the event is, what the evaluative standards are); they may also have differing conceptions about writing and written language than those underlying an activity planned by the teacher (Clark & Florio, 1981; Dyson, 1984a,b, 1985a; Heath & Branscombe, 1985).

Working within the tradition of sociolinguistic ethnography of communication, other researchers are beginning to examine the interactive structure of school literacy lessons with a concern for both *how* the interaction is structured during classroom activities and how that interaction in fact shapes *what* is being learned. For example, Michaels' (1981) work, continued with Cazden (Cazden, Michaels, & Tabors, 1985) demonstrated how teachers collaborate with students to form well-developed narratives and, also, how culturally different views of what is a "well-developed" narrative can disrupt that collaboration. Staton's (1981) analysis of dialogue journals in a sixth-grade class portrayed the teacher's responses to journal entries as modeling, supporting, and serving as an audience for students' increasingly more extended, elaborate, and thoughtful texts. Freedman and Greenleaf (1985), in a study of whole-class composition lessons, developed a system of discourse analysis that accounted for both the structure and the content of the ongoing interactions, and thus illustrated how the teacher made selective use of students' contributions in guiding their collaborative problem-solving. Research extending Vygotsky's (1978) concept of learning through social interaction, while working from a social psychological rather than a sociolinguistic perspective, also focuses simultaneously on the *how* and the *what* of learning; we will discuss this work, particularly as it relates to literacy learning, in Part III of this review.

Writing in the Workplace. Although we are rapidly becoming a highly technological society, literacy skills are still "basic" to participation in many occupational and social communities (Robinson, 1983). As unskilled jobs become automated, literacy will become even more strongly tied to economic survival (Osterman, 1980). Tyler (1983, p. 197) illustrates the trend dramatically: "In 1800, the unskilled in all categories constituted more than eighty percent of the labor force; in 1900, they made up sixty percent; and in 1980 about six percent." As Tyler points out, schools must thus educate *all* students, not simply sort out the promising from the doubtful.

Despite our desire to make all students "functionally literate," we do not have a clear picture of what that term means. As noted earlier, this is a relative characteristic (Robinson, 1983)--its presence depends upon the demands of the situation. The everyday

demands of varied nonacademic occupational communities are just beginning to be studied.

The most extensive study to date is that of Odell, Goswami, and their colleagues who have examined the uses of writing in varied white-collar occupations (Goswami, Felker, & Redish, 1981; Goswami & Odell, 1981; Herrington, 1985; Odell & Goswami, 1982; Odell, Goswami, & Quick, 1983). Their research portrays occupational settings as literacy communities. Workers have clear conceptions of the varied roles of superiors, colleagues, subordinates, and clients and of appropriate ways of using language with each. In interviews about their writing, workers justified their rhetorical choices with references to the rhetorical context, displaying their awareness of their own purpose and the sensibilities of their audience. Goswami, Odell, and colleagues have suggested that such information about varied occupational groups could assist educators in designing and critiquing academic tasks; central to such instructional planning is a consideration of the rhetorical context created for writing tasks in the classroom and the mental strategies students use in completing them (e.g., do students hypothesize about the potential reaction of a reader other than the instructor?).

The students' transition from school to work seems important not only for those students but for the next generation as well. Students' perceptions of their own lack of economic opportunity, based partly on the experiences of their parents, may affect their motivation for and interest in academic achievement (Ogbu, 1974). Ease of entry into occupations where advancement and economic well-being are possible may thus affect the future generation's perception of school. Participation in occupations with extensive use of literacy may affect as well one's way of thinking about and using print and thus also affect the degree to which one's children are exposed to and the way in which they are involved in extended reading and writing activities (Wells, 1981). Preschoolers, students, parents, workers--all are organized in families, where literacy begins.

The Evaluation of Written Language. The goal of English language arts educators is that students become able to participate effectively in varied literacy communities--that they be communicatively competent. The question arises then, what is "good" writing? We start from the assumption that the end products of the writing process may differ, in some sense and probably in several senses, in quality. But it is clear that such evaluations have to be framed, first, in terms of the purposes to which different kinds of writing are put and, second, in terms of traditional evaluative attitudes toward writing styles. There is no single standard for good writing; what is good depends on both the audience and the function to be served. There are, in addition, strong and conflicting opinions regarding what kinds of writing are good and what kinds are not (Newkirk, 1984).

Of particular interest are the value judgments of writing teachers. Some researchers have referred to the importance of internalized evaluative criteria in the teaching of writing skills (Gere & Stevens, 1985; Knoblauch & Brannon, 1984), but there has as yet been little systematic study of this question. The evaluative beliefs of teachers can be seen as a set of ideals they want their students to internalize. But no one has as yet explained what teachers' ideals consist of, except for teacher-raters in testing situations (e.g., Freedman, 1979). It is quite possible that writing teachers do not actually share a common vision of the values they expect their students to learn, and thus that different teachers impart different goals.

Further, as discussed previously, a growing body of research on classroom interaction indicates that when a discrepancy exists between "school language" and "home language," a breakdown may occur in evaluations of what students know and how well they know it (Collins, 1982; Gumperz, 1982; and McDermott, 1977). When students express knowledge in unexpected ways, teachers may assume the students have no knowledge, and when student language is more school-like, knowledge is more readily assumed. Differential instruction results.

In sorting out conceptions of evaluation, we find it useful to distinguish between those evaluative criteria that are intrinsic to the nature of the written language itself, such as those having an effect on readability, and those that are imposed on the basis of tradition or social convention. We can thus distinguish between "intrinsic" and "normative" values.

With regard to intrinsic evaluation, a major question is whether there does exist a component of readability that is tied to the cognitive capacities of readers, and that will thus remain the same across different writing types. If so, writing that puts excessive demands on readers' cognitive capacities, whatever other values it may have, may be less than optimal with respect to its assimilability by its audience. The vast majority of readability studies to date have focused on the refinement of readability formulas (as summarized in Klare, 1974), which are, however, well-known as sacrificing sophistication for ease of applicability. A more sophisticated approach has been taken by the Document Design Project (e.g., Holland, 1981; Redish, 1979), which does not itself, however, have the resources to undertake basic research into the cognitive and linguistic underpinnings of readability. Attempts along this line like those of Hirsch and Harrington (1981) or Vande Kopple (1983) may be promising, but they leave many questions still to be explored, above all the question of exactly how and why features of various types of written language actually contribute to or detract from readability.

With regard to normative evaluation, since the teaching of writing has traditionally depended on prescriptive grammar as a guide to good writing, questions about the relationship between ideas of "correctness" and writing quality arise. (See, for example, the finding of Odell and Goswami [1982] that workers in a county social-services agency gave higher ratings to writing which contained more passive verbs. See also Hake and Williams [1981] for a similar study of teachers' evaluations.) Recipient ideas may differ on what constitutes effective writing (e.g., a well-written complaint or job application as judged by those in the business sector). The history and effects of prescriptivism have recently been discussed in two book-length works (Baron, 1982; Finegan, 1980). There has, however, been no systematic study of how and why specific prescriptions have affected the nature of modern English. (Leonard [1929] and Hergenhan [1939] provided detailed studies of the introduction and spread of specific prescriptive rules in the 18th and 19th centuries.) Preliminary studies of particular rules suggest that their relations to speaking and writing are not always what might have been expected (Chafe, 1985b).

Finally, issues of evaluation must extend beyond the writing episode to the influence of departmental, school, district, and statewide testing programs on the nature of instruction in writing (Cooper, 1981; Cooper & Odell, 1977; Diederich, 1974; Mellon, 1975; Myers, 1980). Competency examinations, now in place in the majority of states, are usually held to have a direct effect on what is taught, though there is no firm evidence as to whether direct assessment of writing skills has led to more emphasis on the teaching of writing.

New Directions

The research reviewed in this section establishes the need for building a social-cognitive perspective. Writing is a tool with distinctive properties and potentialities, but its use is influenced by a social context, a context including the nature of the particular task, the people involved, and the wider social and organizational structures. We see a need, then, to understand the nature of the literacy communities writers encounter across time and space, the demands of those communities, the strategies writers bring to them, and the ways teachers can mediate between the writers and the demands, helping students become full-fledged participants in our literate world.

To achieve this aim, we need information on the sorts of literacy events available to children in the early grades and how children with differing literacy backgrounds and understandings interpret those activities. As children progress through the grades, from elementary to secondary school, meeting differing intellectual and discourse communities, we need to work toward understanding how task demands change, how cognitive strategies--earlier ways of making sense of writing--transfer or do not transfer to these new demands, and how teachers and students interact to build new information or skills into existing knowledge structures. Finally, we need to investigate the demands that exist for students outside the school in the community, particularly in the workplace. What strategies do students need, not only to get employed, but to advance?

Since we are concerned with the performance of students in these varied communities, issues of evaluation cannot be ignored. We suggest investigations of the kinds of evaluations given by different people to different kinds of writing in different situations and those factors, both intrinsic and normative, which lead to differential evaluation. Beyond that, we suggest examining the interaction between teaching and testing. How should the domain of writing tasks be sampled? What criteria for assessment and evaluation are most likely to provide instructionally useful information and, further, to influence instruction itself? Finally, based on an investigation of linguistic and contextual features affecting readability, we suggest considering the possibility of "informed prescriptivism." Is there a sense in which written language of various types can or ought to be "improved"? One thinks immediately of legal, bureaucratic, and academic documents whose readability might well be enhanced in informed ways.

The concerns discussed in this part of our review of research will be continued in succeeding parts, which focus on the process of writing and on the growth of writing abilities. For "social context" is not the purview of only the ethnographic and socio-linguistic research concentrated on here but is, as we have argued, interwoven with both the nature of the writing process and the growth of writing abilities. Important to contributing to more integrative theory building in writing research is a theory building that is based on the realities of the classroom and reflective of the insights of varied disciplinary fields.

Part 2: The Nature of Writing

Without doubt, over the past decade, the line of research that has developed most and has had the most impact on writing instruction has been research on the writing process. Teachers and curriculum planners have used new knowledge to build writing programs based on what has come to be termed a "writing process approach." The *Handbook for Planning an Effective Writing Program: Kindergarten through Grade Twelve* (1983), published by the California State Department of Education, illustrates in

some detail how practitioners can plan a curriculum based on the writing process. Teachers are advised to take students through prewriting activities, have them produce drafts, arrange for them to receive response to their drafts, and give them opportunities to revise and re-examine and then to edit and refine their writing. In this curriculum teachers also are urged to help students see a function for what they have written through publishing and sharing their work with a wider audience than the teacher. In earlier curriculum planning guides of this sort, the focus was on goals for instruction in writing, expectations for what the product should be, and suggestions about activities that would help writers produce a particular sort of written product; the emphasis clearly was on the product, not the process involved in producing it.

The more recent concern with the process has been a useful and probably necessary antidote to the previous preoccupation with product. As notions of process are entering the school, it is time to do two things: to re-embed process concerns in the more general context of language use, and to move beyond merely encouraging the writing process to developing more effective performance-oriented teaching. To re-embed process concerns in the more general context of language use implies the necessity of considering how processes do, or should, vary in response to the changing purposes of the writer, or the changing contexts within which the writing takes place. Related to the second point, in the context of the school, little attention has been given to the specific nature of *effective* process-oriented pedagogies. Recent research on process-oriented instruction in writing has given us information about the problems in applying the process approach in school settings (Applebee, 1984; Freedman, 1985a, in press; Hillocks, 1984). However, a number of issues remain concerning how to construct *process-oriented writing instruction that will affect performance*.

In the first place, there seems to be confusion over exactly what a process approach is. In his meta-analysis of the effects of different classroom approaches, Hillocks (1984) equates the process approach with something he calls "the natural process approach." As he describes it, the teachers following this tack are concerned with having their students "go through a process" or essentially follow a set of procedures that include planning and revising, something more than just transcribing words onto paper. It is not surprising that process, so defined, is not as successful as other approaches. At worst, the natural process approach has shown a tendency to replace one set of essentially unconnected "skill" activities with a new set of equally unconnected "process" activities. This problematic natural process approach has not taken full advantage of the understandings gained by research on the actual cognitive processes underlying writing. Flower and Hayes, for example, who pioneered much of the research on the writing process, emphasize its problem-solving nature; when they discuss teaching the writing process, they advocate teaching the problem-solving skills implicit in effective process strategies (Flower, 1980). Thus, Hillocks' "environmental approach," the approach where he finds the most gains, involves students in solving problems related to writing and is based theoretically in the Flower and Hayes problem-solving research tradition. Important to note here, however, is the fact that Hillocks' findings admit only a single type of activity that is helpful in teaching writing: small-group collaboration. Although the collaborative, small-group problem-solving Hillocks recommends is certainly one useful activity or class of activities, we expect future research efforts to offer a broader view of instruction. Basically, we seem to know little about how our classroom activities (e.g., brainstorming, freewriting, peer response groups) connect to the cognitive processes we intend to support (e.g., planning, goal-setting, thinking about a reader). Additionally, given our social-cognitive orientation, we expect researchers to uncover multiple types of activities that can help teachers of different types of students who are at different

developmental phases. We will argue here, as well as in Part 3 on Acquisition, that researchers need to seek to understand crucial dimensions of variation in student writers.

A second difficulty with studies of the writing process has been their frequent disconnection from the written product. By shifting to an emphasis on performance in writing, it will be necessary also to shift to an integration of process and product. The separation of process and product has led to its own difficulties in applying process research in school settings. Applebee et al. (1984) report that in the secondary schools they studied, the process approach faced substantial obstacles, in part because of the institutional structure of schools. A recent national survey of successful teachers of writing (Freedman, 1985a, in press) reveals that these teachers find responding to student writing during the writing process more helpful than responding to completed products; in essence, they follow a process model. However, the students who were surveyed prefer response to their final products, and the teachers themselves disagree about the kinds of response that are most effective during the process. Freedman's data suggest at least two interpretations: (a) that the socializing effects of schools, with their focus on rewards for products, work counter to students' viewing a process approach positively and also work counter to the successful implementation of the approach by teachers, and/or (b) teachers and curriculum planners are still experimenting with how best to integrate a process approach into instructional settings. Regardless of the interpretation, these findings point to the need for creative solutions of how to integrate considerations of process with considerations of products in school settings.

Next, models of composing must be strengthened. As a first step, there is a need for careful consideration of the relationship between the writing task and the writing process. Essentially, we need to develop process theories that connect cognitive processes in composing to the goals of the writer. We need to recognize the strategic choices in the problem-solving processes that let writers achieve their goals and to develop process instruction that encourages this purposeful cognition. Within this developing theory of purposeful cognition, we also need to recognize variations in composing processes. Here researchers should attend to the approaches of different types of writers, under different types of conditions. Particular attention should be paid to the potentially varied composing processes of writers from non-mainstream populations, to the variations in process that occur as writers develop across time, and to those variations in an individual's process that are linked to the writers' definition of the writing task.

There are several basic influences on the composing process that need further study. One involves the interaction between speaking and writing, an interaction that stems from the fact that those who are learning to write, or to write more effectively than previously, already know how to speak effectively. We need to know more about the relationships between spoken and written language, and how they influence each other.

Another basic influence involves the interaction between reading and writing; it is not only that reading improves writing, but also that reading is a crucial ingredient of the writing process itself. Effective writing depends on writers' abilities to read critically what they have written, and to use such reading as a basis for revision. We need to examine systematically how this happens.

Finally, we need to consider the use of the computer as an aid to writing and writing instruction. The computer has the power to influence fundamentally the very nature of the procedures involved in writing. It is conceivable that new technologies will make many of our conclusions about the procedures that aid the writing process obsolete. Thus, research should attempt to account for impending changes in technology and their potential effects.

A close look at studies of how research on composing applies to the teaching and learning of writing indicates that new research directions could make research on the writing process more helpful than it has been. Such research could be useful to both classroom teachers and software and hardware developers. In particular, an intellectual orientation toward studying both the cognitive and social processes involved in language production leads us to argue for studies of the writing process that will take four new directions. First, we advocate a systematic examination of the influence of institutional settings, particularly the American public school, on cognitive processes during composing and learning to compose. Future models of composing will have to account for social processes embedded in the contexts of composing. Second, the written language itself, or the product, must be integrated more fully into models of and study of the composing process. When what one writes is connected to how one writes, the social context of the writing will be included. Third, the influence of new technology, especially computers, will have to be included in studies of composing. These studies should consider both cognitive influences, including how the computer reduces or increases the demands of the task of writing, and social influences, including students' access to new technologies and how students make use of the available technologies. Finally, patterns of individual differences in composing need to be considered.

Since writing process research has recently received two extensive reviews (Faigley et al., 1985; Humes, 1983), here we summarize the direction of this current research.

The Direction of Current Research

Recent research on the writing process began with Emig's (1971) study of twelfth-grade writers. Emig examined the procedures writers follow as they write. At the time, research on writing was consistent with the concerns of the earlier product-centered curriculum. Typical studies included descriptions of written products across age levels (e.g., Hunt, 1965; Loban, 1963, 1976) and tests of which classroom treatment would produce a better written product (Mellon, 1969; O'Hare, 1973; Braddock et al., 1963).

Emig (1971) provided a new direction for the field. Besides shifting the research emphasis from the written product to the writing process, she influenced research methods. She showed how the case study offered a respectable and informative methodology for studying written language. She pioneered the think-aloud protocol to study writing, an important methodology that gave researchers some access to the thinking process of writers as they compose. Less noticed about Emig's work, but equally as important, is the fact that she used multiple sources of data to inform her conclusions, including, in addition to her think-aloud protocols, extensive interviews with the students about their experiences with school writing and analysis of the writing they produced. Emig broke with the tradition of experimental treatment studies testing particular teaching techniques to focus on studies of process, studies that could give teachers information that might influence their decisions about teaching writing.

Emig learned that excellent twelfth-grade students found school-assigned writing generally unengaging; they spent little time planning what they would say and less time revising it. In essence, school writing was a well-learned, fairly routinized, mechanical activity; its purpose was not to communicate to someone about something nor to help the students themselves grapple with difficult new material. By contrast, the story and poetry writing these students did for themselves, outside of school, engaged their interest more; on such writing, they spent more time on the task, more time planning, and more time revising.

Emig's findings are striking when juxtaposed against Squire and Applebee's (1968) study of the teaching of English in British schools selected as outstanding. In the section of their study on writing, they discovered that students were generally engaged in their writing, but that they received little of what Americans would call writing instruction. Instead they were encouraged to write in multiple forms, which included stories, poems, and plays as well as expository pieces. The teachers saw growth in writing as parallel to more general growth in language and used talk as well as models from reading (over extended periods of time) to help students get a "sense" of the forms they were to produce. Further, much student writing was published for wider audiences than the class itself. Instruction was characterized by teachers who were patiently willing to watch their students develop as writers and who expected their students to take their writing seriously.

Since Emig, many have studied the writing process. Some researchers have used Emig's case study methodology (Pianko, 1979; Stallard, 1979). Others have used protocols but have come from somewhat different research traditions, for example, Flower and Hayes (1981a,b,c, 1983) from rhetoric and cognitive psychology. Others have based their studies on observation of on-line language production (Matsuhashi, 1981; Chafe, 1982, 1985a). On the whole, researchers who study the writing process examine the process of a small number of writers in relatively great detail (see also Graves, 1973; Perl, 1979).

While trying to understand how writers compose, researchers have begun to generate a model or parts of a model of the process of producing written language (de Beaugrande, 1984; Bracewell, Fredericksen, & Fredericksen, 1982; Cooper & Matsuhashi, 1983; Hayes & Flower, 1980; Kintsch & van Dijk, 1978; Nold, 1981; Witte, 1985). Research in these traditions has led to several widely-accepted generalizations about the writing process. Among them are the following:

1. *Writing consists of several main processes--planning, transcribing text, reviewing--which do not occur in any fixed order; rather, thought in writing is not linear but jumps from process to process in an organized way which is largely determined by the individual writer's goals.* Britton et al. (1975) and Emig (1971) give full descriptions of these processes but see them occurring in a more linear order than more recent researchers like Flower and Hayes (1980b, 1981a), who defined these processes, and de Beaugrande (1984), Bridwell (1980), Daiute (1981), Faigley and Witte (1981), Matsuhashi (1981), Perl (1979), Sommers (1980), and Witte (1983, 1985).

Generally, studies that examine planning (e.g., Flower & Hayes, 1981b,c; Rohman, 1965) and reviewing (e.g., Berkenkotter, 1981; Bridwell, 1980; Faigley & Witte, 1981; Sommers, 1980; Witte, 1983, 1985) focus on the more global cognitive functions. On the other hand, those few studies that focus on translating look at

more microscopic aspects of production (e.g., Daiute, 1981; Matsuhashi, 1981; Schumacher, et al., 1983).

2. *The writing process is a hierarchically organized, goal-directed, problem-solving process.* Whatever one writes poses an intellectual problem to be solved on multiple levels. Writers try to achieve the more global goal of communicating an intended message to a reader by setting up that goal as the overriding problem to be solved. In order to solve that problem, the writer sets up subgoals and solves subproblems. For example, when writing an essay in school, the writer must solve the subproblems of how to form letters, how to punctuate and spell, how to construct felicitous written sentences, how to get ideas, how to order those ideas, and so on. Some of these processes become quite automatic and unconscious as the writer matures, while others take time, attention, and skill, even for experienced adults. The goal structure is hierarchically organized, with one goal overarching another (Bereiter & Scardamalia, 1980, in press; Collins & Gentner, 1980; Hayes & Flower, 1980; Flower & Hayes, 1981b).

3. *Experts and novices solve the problems posed by the task of writing differently.* The concept of the novice has been used to include (a) students at all levels whose skills are developing; (b) basic writers who are behind their peers or age group; and (c) young writers or children. Each group has distinct needs.

Experts write what Flower (1979) calls reader-based prose. Students whose skill is still developing, on the other hand, often create writer-based prose. They are described as not consciously attending to, and Flower and Hayes (1977) conclude they do not think about, their reader while they are writing; instead, they are most concerned with the text. Thinking about the reader seems to help the experts plan their essays with goals in mind and to help them generate ideas.

Findings from other expert-novice studies show that experts who were given the same task as developing writers made global revisions while students revised mostly on the word level (Bridwell, 1980; Sommers, 1980). In comparing the changes adult student and expert writers made as they revised their written work and in analyzing interviews with the writers about their revision process, Sommers found that expert writers revised on the discourse level and made changes in meaning; student writers revised mostly on the word level and made changes in form. Bridwell (1980) came to similar conclusions when comparing the revision process of more and less competent twelfth-graders. Hayes, et al. (in press), in describing the cognitive processes of revision, found a large difference not only in the number of problems detected by students, instructors, and professionals, but in the frequency with which each group relied on diagnosis (rather than simply rewriting) and in the repertory of revision strategies each group had for local and global problems.

Basic writers have been found to follow an orderly procedure as they write (Perl, 1979), but they lose their train of thought because they spend so much of their energy during composing attending to mechanical concerns. It also has been suggested that basic writers have a different grammar of written language, an intermediate grammar between speech and writing (Bartholomae, 1980; de Beaugrande 1982; Shaughnessy, 1977).

On a similar note, Rose (1980) discovered that writers who suffer from writer's block follow rigid rules and have inflexible plans. Students who have this type of writing difficulty are stymied because they apply rules rigidly to situations where the rules do not apply. Unblocked writers work with flexible plans rather than rigid rules.

The writing of children will be discussed in the next area, writing development.

4. *The nature of the writing task changes the writer's strategies.* During production, the process of meaning-making (versus elaborating on meaning) takes measurable time; and as one's topic becomes more abstract, less concrete, the more such planning is required. Writers pause more before propositions of predication and connectives than before modification (Matsuhashi & Spittle, 1984). And they pause more when they write pieces in which they must make generalizations than they do when writing reports; further, they pause more before abstract than less abstract sentences (Matsuhashi, 1981).

Applebee et al. (1984), Britton et al. (1975), Chafe (1982), Emig (1971), Heath and Branscombe (1985), Hidi and Hildyard (1984), Kroll (1978), Perron (1974), and Tannen (1982) all show the effects of different modes of discourse on parts of the composing process, be it the amount of attention to audience or engagement with the task itself.

New Directions

As the highlights of findings from past research indicate, research on the writing process has focused on cognitive processes, with little attention to social processes. Much of the research is conducted in controlled laboratory settings where writers are asked to think aloud as they compose (e.g., Emig, 1971; Flower & Hayes, 1983; Perl, 1979). The protocol and case study methods have led to an examination of small numbers of writers who represent a narrow range of populations. The writers studied have been mostly adults--high school or college age--who are writing a single type of academic, expository prose (e.g., Flower & Hayes, 1981b; Perl, 1979; Rose, 1980; Shaughnessy, 1977; Sommers, 1980). They also have been mostly either white and middle-class (Bridwell, 1980; Flower & Hayes, 1981c; Matsuhashi, 1981; Sommers, 1980) or urban minorities (Perl, 1979; Shaughnessy, 1977). Thus, generalizations are made based on the study of only a few types of writers, from a restricted range of backgrounds, of adult age, normally producing a single type of writing. As a first step toward making a better connection between research findings and classroom activities, we need to examine closely social as well as cognitive processes. We advocate a systematic examination of the influence of institutional settings, particularly the American public school, on cognitive processes during composing and learning to compose.

The next unexplored area concerns the explicit linking of strategies for processing writing with the written product. Major findings from the past focus on descriptions of the process alone--that writers plan, transcribe, and revise, that experts proceed in ways different from novices. de Beaugrande (1984) has begun to show links between writing processes and levels of the product being written. But as de Beaugrande himself emphasizes, we are far from understanding these links. If we do not begin to study how processes are connected to products, we will be unable to judge the effectiveness of writers' strategies.

A third area that has received little attention in past research has been the influence of the computer on composing processes. The computer is becoming an increasingly widespread composing tool. Because of the newness of the technology and because of rapid and fundamental changes in the capacity of the technology, it is particularly difficult to design research in this area. Although some researchers are beginning to attempt to understand the influence of the computer on writing (e.g., Bridwell et al., 1985, 1987; Daiute, 1985a,b; Kurland et al., 1984; Levin et al., 1985; Rubin, Cazden, & Michaels, in progress; Von Blum & Cohen, 1984), most findings are still preliminary.

The final clearly unexplored area concerns research on individual differences between writers as they compose. The first efforts have been directed toward building a general model of the composing process (Hayes & Flower, 1980). This general model is powerful in accounting for large numbers of cases and in providing a starting point for examining the more specific strategies within the general model. Now the time has come to look within that model to attempt to understand the strategies that different writers employ. In order to meet the needs of different types of students writing different sorts of pieces under different conditions, we must begin to understand varieties of composing strategies. However, in characterizing these multiple strategies, we need not go to the extreme advocated by Graves (1983), who asserts that variety is the norm, that each writer follows a unique process. Rather, we need to look for patterned differences that have clear implications for instruction, the alternative paths to expert performance. These alternative paths may result from the strategic choices writers make, which may in turn be influenced by the social situation.

How New Directions Could Make a Difference

We have argued for four new directions in writing process research that could help integrate a social and cognitive perspective in studies of composing and that could also lead to more significant improvements in the teaching of writing: examination of the influence of the social context of instructional settings on cognitive processes, integration of process and product in studies of composing, the influence of the computer on composing processes, and examination of variation in writing strategies. These new directions should be coordinated with research on the application of findings to pedagogical settings. We will briefly suggest kinds of research that could make a difference in the effectiveness of the teaching and learning of writing.

Social Context. In this area we suggest building upon the work in classrooms begun by Dyson (1983, 1984a,b), Farr (1985), Goelman, Oberg, and Smith (1984), Schieffelin and Gilmore (1986), and Teale and Sulzby (1986) with emergent literacy, Applebee et al. (1984), Freedman (1985a, in press) and Freedman and Sperling (1985) with secondary- and university-age students. Although this research has been done in different types of settings, we should attempt to generate a coordinated series of studies of the cognitive processes of composing in analogous but different social settings, studying cognitive and social variables both separately and as they interact.

In one line of investigation, we argue for tracing the social factors that influence how writers make sense of what they do. For example, research on non-native speakers from different native language backgrounds reveals culturally embedded discourse forms. In another example, many adolescent boys see their task in school as one of conning the teacher. Thus, they construct writing tasks for themselves that involve defying teacher directions but that still enable them to "get the grade" (Freedman & Greenleaf, 1985). Heath and Branscombe (1985) show how changing the writing tasks and grading structure

in a ninth-grade class turned a group of minority students who had previously been labeled "learning disabled" into average and above-average students. Research along these lines, with careful attention to cognitive consequences, can help us understand how to maximize instruction in writing.

We see benefits in building on Flower and Hayes's examination of how writers construct their writing tasks and how their task construction influences their composing process. To assignments which instructors regard as standard and unequivocal, such as requests to summarize or interpret, students bring their own process strategies. These may differ quite dramatically in the goals students think are appropriate even to entertain. In tasks that involve reading-to-write, for example, some students rely primarily on the text, others on their own prior knowledge, but both appear to lack strategies for integrating these two. Many students are genuinely surprised to discover that their classmates' images of the task are so different from their own. Their problems with writing may be due to a limited set of imagined options more than to "skill."

Another set of questions has to do with adult literacy. Little is known about the cognitive and social consequences of not learning to read and write as a child. We believe it important to pay special attention to this population which may hold clues to the consequences of literacy and illiteracy. Mezirow et al. (1975) and Hunter and Harmon (1979) in status studies of adult illiterates show that adult learners experience varied types of problems. In studies of how adults learn to write (and read), we suggest considering variables such as the sociocultural histories of the learners, their previous education, and the role of writing in their everyday lives.

In summary, future research should examine the key variables that affect how writers compose. This means that it should study writing in naturally occurring social contexts, the processes of varied populations doing varied tasks and writing under varied conditions.

Process and Product. There are few studies linking process and product, perhaps because of the pre-eminence of the novice/expert paradigm for research. In this paradigm, it is assumed that the expert produces a superior product and therefore that it is unnecessary to connect product to process. The connection comes indirectly, from the comparison between the novice and the expert's processes.

Studies of process and product might profitably focus on differences in the ways writers define their tasks for themselves. These differences may come from sources as varied as individual task definitions, social and cultural backgrounds, and demands of the particular settings in which writing occurs.

One set of studies might involve observing the actual on-line process of transcribing words onto paper (or computer screen). In the past, the think-aloud protocol has been one way of getting inside the writer's head. There is an obvious need to use additional data gathering procedures for inferring cognitive processes. Electronic technology has made it possible to record language production as it is happening. The study of spoken language was the first to benefit. Tape recorders have been with us several decades, and have given us the opportunity to register the actual production of a speaker in ways that were never possible before. This ability has been exploited in a variety of ways (e.g., Gumperz, 1982; Labov, 1972; Labov & Fanshel, 1977; Pawley & Syder, 1983; Tannen, 1984a,b). Chafe has made considerable use of tape recordings to

infer cognitive properties of speech production (Chafe, 1980, in press-a) and plans to explore how the computer offers similar options for the study of writing.

Recent on-line observation of writers in action have begun to take advantage of computer technology. We have a few studies of writers' pausing patterns (Bridwell et al., 1985, 1987; Matsuhashi, 1981), their error productions (Daiute, 1981, 1984) and keystroke counts of their revisions (Levin et al., 1985; Bridwell et al., 1985, 1987). However, the analyses have only begun to touch the surface. No serious linguistic analyses of the texts have accompanied these studies. And so our knowledge of the production process remains disconnected from the texts being produced.

Research in this area should build upon the past research on differences between oral and written language, particularly that of Chafe (1980, in press-a). It should extend observation of the on-line production of spoken language to the on-line production of written language. A possible beginning is an investigation of the "covert prosody" of written language: the intonations, hesitations, and other prosodic features assigned to a piece of writing by the writer as well as by readers. This prosody, although it clearly exists, has never been systematically studied. Through such a study we could learn more about how writers' intentions are communicated to readers (for example, through punctuation), about the role of covert prosody in revising and about the contribution of that prosody to readability.

Research should then integrate the findings of such study of prosody with those of earlier investigations of specific differences between spoken and written language. Researchers should extend those investigations to other genres of both writing and speaking, not only to identify differences between speaking and writing, but at the same time to search for social and cognitive reasons for those differences, and to develop new methods of instruction in the ingredients of written language.

Since the evaluation of a piece of writing by writers themselves as they revise, as well as by readers, depends to a large extent on specific properties of the language used, researchers might build on the above studies to explore the relation between linguistic features and the effectiveness of the resulting language. We assume that the evaluation of written language bears some relation to ease of processing by readers, independently of readers' interests or their knowledge of the subject matter. These studies should put us in a good position to evaluate "readability" in an entirely new light.

Technology. Theoretically, the computer could help reduce the cognitive constraints on the writer during composing and thereby alter the very nature of the composing process. Originally, researchers thought that the computer, with its word processors and text editors, would have a generalized effect on the amount and nature of revision. However, the issue appears more complex. For example, Bridwell et al. (1985, 1987) find that university students do not revise more on the computer than off. Rather, writers use computers in ways that are functional for them (Bridwell et al., 1987). The conventional word processor, in and of itself, does not necessarily change the higher-level goals that influence writers' processes.

Further, for young children the computer does not seem to promote higher-level revisions (Daiute, 1985a). The computer does, however, offer a more flexible writing medium and stimulates children to make more mechanical revisions than when they are not using the computer (Daiute, 1985a; Levin et al., 1985). It proved easier for the children to remember the commands to make low-level changes than to remember the

more complex sequences that allowed them to make global changes. Thus, the software may facilitate the lower-level changes more than it does higher-level changes. It is easier to change what you can see than what you can't see. Also, typographical errors made on the computer may lead to an increase in low-level revisions that would not be necessary in handwriting.

Researchers have only just begun to develop software that is meant to assist the writer during composing and thereby change his or her writing process (Card, Moran, & Newell, 1983; Daiute, 1984, 1985b; Frase et al., 1985; Kaufer, 1985; Neuwirth, 1985; Von Blum & Cohen, 1984; Woodruff, Bereiter, & Scardamalia, 1981). Some of these programs are word processors designed for writers which include aids for writers to call upon, whereas others act as teaching tools for specific component skills which the authors hypothesize are needed for writing. As writers begin to make use of specially developed software, it becomes possible to study changes in the developing composing process. It is now time to begin not only to take a serious look at the impact the new technologies are likely to have, but also to begin to influence that impact (e.g., Bereiter, Brown, Kintsch, & Scardamalia, in progress).

Changes in software and hardware could profoundly affect the role the computer will play in the composing process. For example, computer systems with a mouse or cursor that can be moved by hand pose different difficulties than a system in which commands must be entered at a keyboard. Future technology promises such innovations as voice input, something that may revolutionize writing for small children and that may encourage more widespread oral composing. Tutoring systems, such as those being developed at Xerox PARC, could potentially influence the nature of composing as writer and computer interact. Likewise, changes in the instructional setting, brought about by the ease of collaborative writing and computer networking, may change how writing functions, how writers compose, and how they can learn to compose.

Equally as important as the technology and its consequences is the question of how the technology will be integrated into teaching settings. Who will have access to computers? Will access be differentially distributed? How can computer access best be managed in school settings? Teachers do not know how best to make use of the equipment that is coming their way. We need to develop descriptions of how teachers of writing make use of computers in the teaching/learning process and of what the effects of computer use are on student learning. Already there is evidence that girls do not feel comfortable in the computer labs that are cropping up in our schools (Kreinberg & Stage, 1983). Another issue of access has to do with who has computers in the home. At the moment, it is mostly professional and middle-class families that have computers (Becker, 1983).

Individual Differences in Composing Strategies. We believe that the research results most useful to the classroom teacher will be the description of various but patterned models of composing strategies. We hypothesize that in writing, as in other academic domains (see work on individual differences, e.g., Cronbach and Snow, 1977), there are important and significant individual differences, and that these individual differences are not idiosyncratic but patterned. As in other academic domains, different types of learners will flourish with different types of instruction. It is critical that we begin to define patterned variation in writing processes.

In essence, we must uncover students' implicit models of the composing process, how they define writing tasks for themselves, the goals and strategies they not only

possess (e.g., have developed or learned) but also the ones they actually use in different writing tasks. When we see these models against the backdrop of general cognitive processes, we see how fully students' strategic choices draw on the potential of these processes. Against the backdrop of relevant experts and developing novices we see the options to work toward. Against the backdrop of other students, we see how the writers' assumptions and the setting may unnecessarily limit what they are really able to do.

Part 3: The Acquisition of Writing

People interested in the everyday task of teaching students, developing programs and materials, and assessing learning progress must answer the questions of what, when, and how to teach. Experts in both oral and written language development urge teachers to observe, respond to, and build upon what students can do. Over the last decade, our knowledge of both the developing writer and ways of responding to that writer has burgeoned. Researchers should focus on weaving together and extending this knowledge into a more cohesive picture of how skilled writing (learning to write and using writing to learn) grows and develops across the age span and across diverse populations, and how that growth is related to the demands of the instructional contexts through which teaching and learning occur. We should pay particular attention to identifying both patterns and variability in growth.

The very nature of schools, which sequence students in grades and subject matter in scope and sequence charts, leads to a desire for a sequence of skill acquisition in writing. A simplistic sequence of writing development, however, cannot be given, both because of the holistic nature of the writing process itself and because of the varied interconnecting systems which define its nature (Bereiter, 1980; Shuy, 1981).

Children are initiated into the use of writing as a tool for communication--as a holistic process--during the preschool years. As a basic means of communication, one that is interwoven throughout their environment, it is available for them to investigate, to play with, and to use in personally satisfying ways. Thus, children themselves, including non-middle-class children, actively seek out and experiment with written language (Heath, 1983; Taylor, 1983). As they do in learning other symbol systems (Werner, 1948), children experiment and approximate, gradually becoming aware of the specific features of written language and the relationships among symbols, sounds, and meanings. In their efforts, as Harste, Woodward, and Burke (1984) have illustrated, preschoolers, like all literacy users, are guided by the assumptions that written language must make sense in a particular situation and, at the same time, that written language varies across situations.

This written language learning is complex, as written language, like oral language, is a "complex of interconnecting systems," including syntactic, semantic, and discourse rule systems (Nelson & Nelson, 1978, p. 225). The complexity of the written language system is reflected in the diverse perspectives of the literature on writing development. Researchers have focused on children uncovering varied aspects of written language, including:

1. perceptual features: what it looks like (e.g., Clay, 1975);

2. symbolic nature: the relationship between print and formal aspects of speech (e.g., Ferreiro, 1978, 1980; Ferreiro & Teberosky, 1982; Read, 1975);

3. discourse characteristics: the conventions that determine how connected discourse is put together, as in the structural features of stories (e.g., Applebee, 1978) or the cohesive features that link sentences to form texts (e.g., King & Rentel, 1979, 1981, 1982);

4. processes: the processes through which a dynamic experience is transformed into an explicit, ordered, and linear format (e.g., Graves, 1973; Perl, 1979) and, conversely, by which a linear display is transformed, through both graphic and language cues into an understood experience (e.g., Clay, 1979; Mason, 1980);

5. communicative nature: how meaning conveyed in print relates to the knowledge of both the writer and the reader; that is, that sustained written language, to a greater degree than conversational oral language, must be interpreted apart from the context of a specific or personal situation (e.g., Cook-Gumperz & Gumperz, 1981; Donaldson, 1978; Wells, 1981); and

6. functional capacities: the uses of written language (e.g., Heath, 1983).

The writing literature has provided both general descriptions of development and more focused descriptions within these varied areas. In all such descriptions, researchers describe learners as progressing in the direction of mastering the conventional system, following expected developmental principles articulated by Piaget (Piaget & Inhelder, 1969) and Werner (1948) (e.g., beginning in a global and approximate way, actively searching for patterns, differentiating features of the written language system).

Yet, although we can logically analyze the varied aspects of writing, learners come to us as wholes, not displaying their knowledge of these aspects in neat sequential order, but in clumps which the researcher and teacher (not the learner) must separate into neatly organized categories. Further, written language, like oral, is not an independent entity but is subject to the demands of the situation. Like a kaleidoscope, its parts are ever newly arranged, newly revealed. And, finally, the person controlling the kaleidoscope has his or her own intentions and style, his or her own sense of what's interesting. That is, as Bussis et al. (1985) point out, individuals who share similar knowledge about written language may have differing stylistic preferences for organizing and orchestrating that knowledge for acting, thinking, and expressing meaning. Thus, the nature of the individual learner, the nature of the situational context, and the complex nature of the writing system itself all interact in written language growth, just as they do in oral language growth (Dyson, 1985a).

The interplay of these factors suggests that individual differences are to be expected in writing development. Nelson (1981), focusing particularly on oral rather than written language, has argued strongly for the recognition of variation in development:

> Because functional contexts are correlated with frequency of particular [linguistic] forms and constructions and because different children are exposed differentially to various types of contexts, different children will begin to put different parts of the language system together initially, and the course of acquisition will look different for different children. (p. 183)

We, therefore, should not expect to produce a one-dimensional description of writing development that can serve as a template for all learners. We could, however, contribute to a description of patterns of development within each system, an analysis of the relationship between these developmental patterns and broader patterns of cognitive and linguistic development, and examples of the varied ways these developmental strands may be interwoven as individual learners grow and change. We should furnish insight into how the dynamics of varied contexts, including classrooms and instructional activities, affect what students learn and, also, how they draw upon and display what they have learned. And we should identify the dimensions of behavior (stylistic preferences) within which variation across learners occurs. In short, we should work toward a developmental theory of writing that accounts for both its intricate nature and its dynamic interrelationships with context (see Shuy, 1981) and, at the same time, that honors the tremendous variability and flexibility of the human learner (see Bussis et al., 1985).

To build this theoretical framework, we see a critical need for new research directions. Two decades ago, many writing studies were developmental, as attention focused on the syntactic complexity of children's sentences (Hunt, 1965; Loban, 1963, 1976; O'Donnell, Griffin, & Norris, 1976). That work documented the development over time of syntactic maturity and, also, provided evidence for future work showing that this growth could be encouraged by training (O'Hare, 1973). Some detailed developmental analyses of children's products has continued, particularly in the pioneering work on children's spelling (Read, 1971, 1975) and, more recently, on children's discourse structures (King & Rentel, 1981, 1982). The seventies, though, also brought a growing focus on the complexity of the writing process itself. Process research, however, has focused primarily on college students and adults and has investigated the differing skills of good and poor--expert and novice--writers (Humes, 1983).

This work has illustrated the complexity of the writing process, which now appears as intricate and intriguing as the act of speaking. Further, this work continues to document the sorts of strategies writers employ, identifying those used by more and less sophisticated writers. Thus, work on expert/novice writers has, for example, called our attention to details of such processes as planning (e.g., Flower & Hayes, 1981b,c) and revising (e.g., Bridwell, 1980; Faigley & Witte, 1981).

These descriptions, however, do not allow us to say what children should be doing at varied points of time, nor do they allow us insight into how children's abilities develop over time. For example, in oral language development, Bruner et al. (1956), Brown and Bellugi (1964), Flavell (1985), Heath (1983), Menyuk (1969), Snow and Ferguson (1977), Slobin (1986) have all illustrated that children have their own systems for using language and that these change in orderly, predictable ways over time. Further, children's incorporation of knowledge into their systems does not necessarily lead to an obvious "improvement": the knowledgeable adult is delighted, not distressed, when a preschooler switches from "went" to "goed" or from "feet" to "foots."

The implication, then, as Langer (1984b) has pointed out, is that we must also identify, not what novices do not know, but what they do know. In other words, we must begin to identify what constitutes "knowing" at varied points in time and how that knowing changes along the way--how it gives rise to more sophisticated ability. In short, future research must examine the writing process developmentally, looking for *transitions over time*. Further, our increasing *knowledge about children's products must be integrated with knowledge about the composing processes* (e.g., goals, plans) behind them.

Bereiter, Scardamalia, and colleagues have begun to examine the writing process in intermediate and middle school students. Their experiments combine a focus on the process with a concern with product features. They are attempting to describe what happens during learning to write, including students' knowledge about writing and their ability to use that knowledge (e.g., Scardamalia, Bereiter, & Goelman, 1982). This work continues to yield insights into the intricacy of writing, linking its growth with broader patterns of cognitive development. As with expert/novice studies, we see this research as a valuable part of writing research, but as only a part. We see the need as well for new directions. As Cole and Traupmann (1981), McDermott and Hood (1982), Rogoff and Lave (1984), and others have pointed out, experimental procedures cannot provide insight into how cognitive abilities develop in the everyday world; the human intentions and situations that serve as resources for organizing behavior are not there. In addition, then, to developmental investigations which integrate concerns with processes and product, there is a need for *examinations of the social contexts within and through which these processes develop*. As Florio-Ruane (1983, p. 98) argues:

> It is perhaps equivalently naive to assume that writing will simply be acquired "naturally" by all school children in our society as it is to argue that writing can be reduced to sequential practice of discrete technical skills. If we are to avoid "magical thinking" about writing instruction arising from either assumption, we need to understand more clearly the nature of task environments for writing in school and how teachers can intervene meaningfully to support the acquisition process.

There have been examinations of very young writers in context; these investigations have taken the form of case studies (e.g., Bissex, 1980; Dyson, 1983, 1984a,b; Gourley, et al., 1983; Graves, 1975, 1983). These studies have tended to emphasize variability and broad developmental trends (e.g., simple to complex) rather than specific patterns of growth.

This emphasis on variability is sensible, both in the light of individual differences and in terms of case study research itself. Yet, while each case study cannot in itself be generalized, as cases accumulate, so should our understanding of the complex, interrelated variables involved in development (Stake, 1978). There is a need, then, to systematically integrate the cases that do exist, searching for patterns in knowledge and strategies specific to writing that hold across children and specific dimensions along which variation occurs. In all cases, detailed knowledge must be available on children's products and processes, the social setting, and the role of the observer, particularly any interventions adopted. It is *not* the case that the development of individuals is an internal process that can be examined divorced from external interactions, a unifying theme in this report (cf. Graves, 1982). Such detailed and integrative work will offer insight into the language processes, learners, and the varied settings in which written language is used. As we understand the patterns governing how individual children or groups use language, we will be able to better manipulate learning environments (activities, ways of interacting) to support the varied individuals in our classrooms.

In these studies of writing development children from diverse cultural and linguistic backgrounds should be included. We do not assume that, if we describe the processes and structures used over time by mainstream writers, we can better instruct all writers who are unsuccessful in school writing tasks. We should therefore attend to the development of mainstream and various kinds of non-mainstream writers in order to expand our conceptual frameworks.

In the next section, we examine more closely the developmental research upon which we can build.

The Direction of Current Research

In acquiring any skill, learners orchestrate varied strands of knowledge (Polanyi, 1958). In learning to write, these strands include knowledge about the kind of symbol system written language is, the activities or processes writers engage in, the forms completed texts take, and, in all areas, a sense of the sorts of situations in which these varied processes and forms--and written language itself--are used and the sorts of purposes they serve. In Part 2, we considered the literature on the writing process. Here, then, we will look at current research in the other strands.

Areas of Growth. *Knowledge of the Symbol System.* Any symbol system involves using distinct forms to refer to separate experiences. In Werner and Kaplan's (1963) model, this symbolizing involves the symbol itself (e.g., the graphic form), the symbolic referent (the experience being referred to), the person producing the symbol, and an intended recipient. In developing as symbol users, children separate more clearly symbols and their referents, producers and recipients, and they learn new ways of linking these elements.

Children are initiated into the use of written symbols during infancy (Baghban, 1984). However, children control first-order symbols systems, like speech and drawing, before they control second-order systems like written language (systems in which one symbol stands for another, as the written graphics stand for the spoken word). Researchers have pointed out that children use drawing and talk to support their early exploration of and use of print (Dyson, 1982; Graves, 1981; Gundlach, 1981). A study of writing development, therefore, necessitates placing writing's emergence within the framework of children as developing symbol users, who are leaning upon the links between symbol systems as they discover the unique structures and strategies of each.

Children themselves make clear this linking, as they declare their interest in "writing houses and stuff." That is, they understand that writing, like drawing, is a way of representing experiences. Children may, in fact, initially view writing as similar to drawing in the way that meaning is encoded. That is, they may view writing as direct symbolism: children do not form letters to represent speech, but to directly represent known people or objects. In their view, readers may elaborate upon, talk about, written names (Ferreiro & Teberosky, 1982).

Children talk about both their drawings and their writing (Korzenick, 1977). When asked to draw and then compose about one topic, the drawing, and its accompanying talk, generally demands the greatest attention (Graves, 1983). Further, the writing does not necessarily tell about the picture as much as it cooperates with the picture in the telling (Dyson, 1982,1983; Gourley et al., 1983; Newkirk, 1982).

Discourse Structures. As with oral language, one's personal meanings are shaped and expressed through socially shared structures--patterns for language use. Children learn about the structures and strategies used by the written symbol system as they observe and participate in literacy events or activities. For example, Clay (1979) and Holdaway (1979) describe children's sensitivity to the linguistic patterns of well-known books--children learn to "talk like a book" (Clay, 1979). Harste, Woodward, and Burke (1984) have found that, by the start of first grade, children use organizational structures that

clearly mark genre: there are clear differences in the surface forms of letters, maps, lists, and stories. King and Rentel (1981, 1982), in their longitudinal study of coherence in children's writing, found that by the time children enter first grade, they have fundamental understandings of the various cohesive devices that hold a text together, and that such knowledge varies with genre. Gundlach (1981) similarly found that, like children's spelling (Henderson, 1981; Read, 1975) and syntax (Loban, 1976; O'Donnell, Griffin, & Norris, 1967), discourse structures undergo transformations several times throughout the school years.

Most research on the development of discourse forms has focused on narrative and expository structures. By the time children begin formal schooling, they display an understanding of many underlying features of narratives in their own stories (Applebee, 1978; King & Rentel, 1981; Leondar, 1977; Stein & Glenn, 1979). Children tell stories with recognizable characters engaged in simple plots, with beginnings, middles, and ends. They know the conventional "once upon a time" beginning and, less often, the "happily ever after" ending, and place intervening events in the past tense.

Although this knowledge occurs quite early, children continue to develop their narratives throughout the school years. For example, it is not until the middle school years that detailed information about characters' motivations and reactions is regularly included in their stories. Similarly, elaborate accounts of how events unfolded are not consistently given until the middle and junior high years (Bartlett, 1981).

There is less information available on children's expository prose, but what is available suggests an even more gradual development. While young children do use exposition (Bissex, 1980; Langer, 1986; Newkirk, 1984; Taylor, 1983), the work of Scardamalia, Bereiter, and their colleagues suggests that even junior high students are still grappling with its framework (e.g., Bereiter, 1980; Scardamalia, 1981). These researchers suggest that children's difficulty with these forms has to do with their general cognitive development--that is, children have difficulty integrating the multiple ideas contained in exposition into an orderly whole. The fact that students may have less exposure to models of exposition, as opposed to narration, may also contribute to their difficulty.

Knowledge About and Through Writing: Writing and Learning. Our aims as educators and researchers are not simply to help students acquire knowledge about writing's symbolic nature, its processes and forms, but to assist them in gaining control over writing's power, so that they can use it to accomplish a range of purposes. In school, the most obvious of these purposes is to learn, not just about writing, but about the world. In this sense, our concerns go beyond the English language arts to encompass the entire curriculum. The variable demands of the diverse curriculum should promote both students' learning and their writing power.

Beginning particularly with British educators in the seventies (Britton, 1970; Bullock, 1975, Martin et al., 1976), writing's role in learning has been widely discussed. A view of writing as an agent for developing both higher-order thinking skills and the grasp of advanced subject matter concepts is reflected in the National Institute of Education's early research agenda in writing (Whiteman & Hall, 1981) and in the curriculum suggestions offered by advocates of "writing across the curriculum" (e.g., Applebee, 1977; Barr, D'Arcy, & Healy, 1982; Fulweiler & Young, 1982; Newkirk & Atwell, 1982).

This conception of writing as a tool for thinking and learning is supported by our knowledge of written language itself, of the writing process, and of cognitive and language development. In all areas of symbolic development, symbols and referents are discovered synergically (Werner & Kaplan, 1963): our ideas take shape within and through symbols. As developmental psycholinguists have illustrated, children learn language as they learn about the world (Brown, 1973; Halliday, 1975; Nelson, 1973). Children use language to seek the identity of and label what they are noticing in their environment, and they use the categories provided by past experiences to interpret new ones.

Initially children's language and thinking is embedded in ongoing events (Donaldson, 1978). During the preschool and early school years, children's language becomes free of what they can see and manipulate and thus becomes a tool for thinking and referring to the present, the past, and the possible future (Bloom, 1975; Wells, 1981). Recently researchers have emphasized the contribution of schooling and written language to the freeing of both language and thinking from immediate experience (Cook-Gumperz & Gumperz, 1981; Donaldson, 1978; Olson, 1977; Olson & Nickerson, 1978; Olson & Torrance, 1981; Wells, 1981). In school, written language, and much of oral language, exists apart from a familiar social and physical setting--such language is "decontextualized." Children must reason about meanings conveyed primarily through words alone.

This ability to transform an experience into language and then think about it--analyze it, compare it to previous experiences, and, perhaps, reinterpret it--is seen as the heart of higher-level cognitive functioning by researchers and theorists who have significantly affected current views on both cognitive and linguistic growth (Bruner et al., 1956; Piaget & Inhelder, 1969; Vygotsky, 1962, 1978). The goal of education must be, in part, a reflective human being who is capable of "intellectual self-control" (Donaldson, 1978)-- of monitoring ongoing thinking, stopping and giving pause, considering possibilities and alternate routes, of taking necessary steps to disentangle confusions and make sense (Brown, 1982). A concern with the development of such a reflective citizenry is evident in the current interest in metacognitive skills, of individuals' knowledge about and control of their own thinking (e.g., Brown, 1978, 1980; Flavell, 1985).

In many ways, written language seems ideally suited for such reflection. As Olson (1977, p. 278) argues, the "bias of written language toward providing definitions, making all assumptions and premises explicit, and observing the formal rules of logic produces an instrument of considerable power for building an abstract and coherent theory of reality."

Applebee (1984), in a review of the literature on writing and reasoning, summarizes the characteristics of writing that have contributed to its perceived role in thinking and learning: (a) the permanence of written text, which allows writers to rethink and revise over time; (b) the explicitness writing demands, if meaning is to exist beyond the context in which it was originally written; (c) the resources provided by the conventional discourse forms, for organizing and thinking through new ideas and for making clear the relationships among them; and (d) the actively creative nature of writing, providing a medium for considering the implications of otherwise unexamined assumptions.

This view of writing as a vehicle for critical thinking and understanding rings true to reports of professional writers that composing is not a process of putting down one's understandings, but of coming to understand (Murray, 1984). In Darwin's words, writing "forc[es] me to think long and intently about every sentence, and thus I have been led to see errors in reasoning and in my own observations or those of others" (1892/1958,

p. 65). Studies of the nature of writing (see Part 2) also seem compatible with this notion of writing as "problem-solving" (Flower & Hayes, 1977). Writing strategies for generalizing and organizing content, for evaluating and revising one's text are also cognitive strategies for generating and organizing one's ideas (Bereiter & Scardamalia, 1982; Flower & Hayes, 1981b; Scardamalia, 1981).

Writing Acquisition: The Role of Adults and Peers. Although writing is generally viewed as a solitary activity, we are primarily concerned with teaching and learning to write, processes that are social, as they take place within the social structures and dynamics created by teachers and students in classrooms. Another area of inquiry, then, has to do with the role of teachers and peers in writing development.

Any kind of learning consists of the discovery of order, of patterns, that allow us to comprehend ongoing events and to anticipate future events. As we are each unique in our make-up and experiences, our constructs are, as Kelly (1963) pointed out, personal. At the same time, they arise from our daily experiences with objects, people, and events in our environment and are thus inherently social.

Our understanding of the role of others in learning has been influenced by the theoretical ideas of Vygotsky and, more specifically, by research on the child's acquisition of language. Vygotsky argued that learning is a social process; children are initiated into the use of their culture's signs and tools, such as written language, by their interactions with other people:

> From the very first days of the child's development, his activities acquire a meaning of their own in a system of social behavior and, being directed towards a definite purpose, are refracted through the prism of the child's environment. (1978, p. 30)

Children join in ongoing social activities, engaging in problem-solving with others. Gradually, they begin to internalize--take over internally--the processes they initially performed collaboratively. Thus, the social system in which children participate shapes the cognitive development of individuals (Rogoff & Lave, 1984).

Vygotsky suggested that these collaborative activities lead the child's development forward. Learning does not wait upon but in fact leads development, as the instructor aims for the learner's "zone of proximal development...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with peers" (1978, p. 86).

Multidisciplinary work in developmental psychology, cognitive science, and anthropology has focused on understanding more precisely how thinking is influenced by social activity (see literature review by Rogoff, Ellis, & Gardner, in press). From studies conducted in a variety of home, work, and school settings, we are gaining a clearer understanding of how instruction, as a pervasive phenomenon of everyday life, occurs. In this conception, the teacher does not simply direct the learner's performance, but rather, collaborates with the learner; that is, the teacher models the problem-solving process but also involves the learner in the solution. In engaging the novice, the teacher is sensitive to the learner's current skills and understandings, providing support to help the learner move along (Cole & Griffin, 1980; Wertsch et al., 1980). "In

instruction using the zone of proximal development, the adult oversees the construction of an instructional context by establishing references to what the child already knows. This context allows the child to build new information or skills into the existing knowledge structure" (Rogoff & Gardner, 1984, p. 100). Clearly, successful instruction is dependent on the adults' "headfitting," Brown's (1979) term: the closer the distance between what the learner already knows and the information to be acquired, the more likely it is that instruction will be successful.

In this conception of teaching and learning, there is a sense of Stern's (1977) description of adult-infant communication as a dance, in which mother and child accommodate to each other. In fact, it is the child language literature that provides perhaps the clearest illustrations of the learning of information and skills through interaction (e.g., Cross, 1975; Snow & Ferguson, 1977; Wells, 1981). Researchers have examined the nature of caregiver/child interaction, as well as the nature of the learning that results. Particularly relevant here are the mother/infant studies by Bruner and his colleagues (Bruner, 1978; Ninio & Bruner, 1978; Ratner & Bruner, 1978). They have characterized the adult role as one of providing *scaffolding* that supports early language learning. Adult/child interaction is built around familiar and routinized situations, such as peekaboo games and storytime rituals, that serve both as immediate ends in themselves and as the contexts within which the child gradually learns more sophisticated language functions: mothers "would introduce a new procedure and gradually 'hand it over' to the child as his skills for executing it developed" (Bruner, 1983, p. 60). Studies focusing specifically on early literacy learning also describe children as learning about the functions, processes, and specific features of written language as they participate in the literacy activities interwoven in everyday life (Schickendanz & Sullivan, 1984; Scollon & Scollon, 1981; Taylor, 1983; Teale, 1986). Early language learning in non-mainstream homes and communities indicates that scaffolding dialogues may take different forms in different cultures (Heath, 1983; Schieffelin, 1979).

This conception of the interactive nature of instruction is beginning to be used as a framework for examining instruction. In 1979, Cazden summarized recent research on discourse learning and proposed Bruner's studies of "peekaboo" as a starting point for a new instructional model, and many such efforts have begun. For example, in the area of reading comprehension, Brown and her colleagues have developed the concept of *reciprocal teaching* (Brown, Palincsar, & Purcell, 1986; Palincsar & Brown, 1984), which provides a practical realization of Vygotsky's theory: tutors engage in dialogues with learners; their interactive activities are clearly structured and aimed at the upper limit of the zone of proximal development; initially the tutors dominate the interaction, but gradually the learners internalize, take over, the modeled procedures, as those procedures become part of their own cognitive efforts.

Bereiter and Scardamalia (1982), working independently, arrived at similar instructional strategies which they term *procedural facilitation*. This teaching practice, which aims at developing students' composing strategies, focuses on learners' cognitive activities, not on the actual content of their texts. The teacher, or mechanical support system (word processor, cuing cards), enables students to carry out more complex strategies during such tasks as content generation and revising than the student could carry out alone. Still another application has been offered by Applebee and Langer (1983; Langer & Applebee, 1984). Referring to their concept as *instructional scaffolding*, they have discussed its relevance to the range of instructional settings that occur in schools, from teacher/student dialogue to the interaction that takes place between student and workbook.

These efforts to apply the concept of scaffolding to teaching and learning in schools are appealing. They are compatible with our understanding of language development in general and, also, with our stated concern for supporting the cognitive activities involved in the writing process. They offer, then, a way to conceptualize more clearly the role of knowledgeable others in supporting students' growth.

Studies of instructional roles center on the respective roles of teachers, peers, and technology as responders to and evaluators of student writing.

Adult and Peer Response to Writing. A key way that the social nature of writing is enacted is through the response process. Most writing instruction centers upon a cycle of writing, response, and writing (Freedman, 1985a). Unlike conversation, in which speakers receive ongoing feedback from listeners, writers must respond critically to their own efforts (Bereiter & Scardamalia, 1982; Gumperz, Kaltman, & O'Connor, 1984). In assisting developing writers, teachers provide a variety of kinds of response. Certain kinds are essentially automatic, particularly the correction of surface errors in the conventions of written language (e.g., spelling, punctuation). Other kinds of response (e.g., comments on organization, content) are time-consuming if done well, and may be unproductive in that they usually come as part of a grading process after a writing task has already been completed (Sommers, 1982). Studies of the effectiveness of written response suggest, in fact, that many written comments are not done well (Freedman, 1984). Often they are global remarks that are not tailored to an individual's paper nor do they move beyond a concern with the form and mechanics of the writing (Searle & Dillon, 1980; Sommers, 1982).

Reacting to such problems, many teachers and practitioners have begun to emphasize writing conferences as more productive means of providing an attentive, helpful audience (Freedman, 1985b; Graves, 1983; Murray, 1984; Witte, et al., 1981).

The concept of scaffolding is easily applied to both adult and peer response techniques. (For discussions of peer response see Elbow, 1973; Freedman, 1984; Gere, 1987; Healy, 1980; Moffett, 1968; Murray, 1984.) Teachers or peers ask questions of students in a format that is structured enough to be predictable to learners and yet flexible enough to allow the teacher to follow the student's lead in identifying issues to be discussed. The goal of teacher conferences and peer groups is for learners to internalize the questions the teacher asks and thus to begin to ask those questions of themselves.

Whereas teacher conferences have received some study, peer response has been examined only rarely (Gere & Abbott, 1985; Gere & Stevens, 1985; Nystrand, 1986). There is a great need to look at how specific types of response can be used most effectively in the teaching/learning process.

Computer Response to Writing. There is increasing interest in the power of computers to provide instructional, responsive formats for writers (e.g., Daiute, 1983; Woodruff, Bereiter, & Scardamalia, 1981). Several researchers have identified features of the computer learning environment that make it pedagogically interesting (Lepper, 1985; Linn & Fisher, 1983). Three of these features deserve special mention. First, the computer is interactive, a feature that clearly raises questions about its potential as a "scaffolding" tool. Unlike many school environments where students turn in assignments and get them back days or weeks later, the computer environment can provide

immediate interactive response to at least some features of student writing. Thus, students can quickly revise what they are doing if the computer indicates weaknesses or, in a more open-ended environment, if it suggests directions for further elaboration.

Second, the computer learning environment is precise. This preciseness means the computer can respond fully to specific information. As yet, tools for providing precise feedback on lengthy written tasks are not available. A variety of aids is available that provide immediate feedback on sentence-level skills--particularly at the level of grammar and spelling, and in some cases extending to more complex stylistic features such as variety in sentence length.

Third, the computer learning environment is extremely motivating. Young children will spend hours searching the computer keyboard for the appropriate letters so that they can see their stories in high resolution, large print. Brainstorming and problem-solving activities may similarly become a more widespread part of writing instruction when they are available in more sophisticated computerized formats.

New Directions

To build upon existing research, we emphasize the importance of research that integrates knowledge about children's products with information about composing processes, that looks for patterns and variability in transitions over time, and that captures the dynamic interaction of the growing child with the objects and people in the surrounding world.

Areas of Growth. *Knowledge of the Symbol System.* Although we have a clear awareness of young children's writing as, in Harste, Woodward, and Burke's (1984) words, a "multimodal" event, we now need to look more closely at how children interweave these varied means of symbolizing (Dyson, 1982). How precisely do children use talking, drawing, and writing to carry out the processes and encode information in varied writing situations? How does that interweaving change over time? Considering the evidence for individual differences in styles of early symbol use (Gardner, Wolf, & Smith, 1975), there is a need for information on the dimensions of variation in this weaving. It may well be that, rather than the "beginning" of writing, there are a range of possible beginnings.

Discourse Structures. Descriptions are emerging of what discourse structures are like at varied points in time. Our attention now needs to focus as well on understanding the sorts of transformations that happen over time in these forms and how those transformations take place. It may well be, as Bartlett (1981) suggests, that the forms of discourse, like children's drawing schemata (Goodnow, 1977) and grammatical structures (Slobin, 1979), undergo gradual transformations of existing basic forms. In this case, we would expect that, rather than adopting wholly new structures, children solve new text-forming problems by gradually making adaptations of their existing forms. This idea seems supported by Langer's (1984a, 1986) finding that, even as late as ninth grade, students did not regularly use such complex expository forms as problem/solution, causality, comparison of alternatives. But, when she examined lower level, more circumscribed structures, she found that indeed more complex expository structures did gradually appear across the school years. This notion of writing, like drawing and speech, as a conservative activity, where features are added on before internal transformations occur, may prove to be a helpful one in understanding how children's knowledge of written language develops, what signposts of progress exist, and what helpful ways of guiding their efforts may be. There is a need to study the extent to

which school experiences foster experimentation with new and more complex forms and the characteristics of situations in which this occurs.

Knowledge About and Through Writing: Writing and Learning. There is a need now to begin to see precisely what and how writing contributes to learning. There has been, in fact, little research that attempts to link writing to the development of particular higher-order thinking skills (Applebee, 1984). In order to begin to understand this connection, we need to move away from broad considerations of "writing" to more careful examinations of the purposes and processes that varied writing tasks entail. The effect any writing activity has on thinking appears to be linked to the purpose that writing serves and the sorts of cognitive activities it involves (Newell, 1984; Scribner & Cole, 1981). Further, since both students' reasoning ability and their writing ability change in complex ways through the pre-college years, the relationship between writing, reasoning skills, and learning must be equally dynamic and therefore should be considered from a developmental perspective.

Finally, understandings of the relationship between writing and learning must consider the varied contexts for writing existing throughout the schools. Despite the interest over the last decade in "writing to learn" and "writing across the curriculum," most writing tasks in school seem to involve writing as practice for mastering the mechanics of writing (Graves, 1978) or as recitation of what has already been mastered in a particular content area (Applebee, 1982). Thus issues of curriculum and professional development must also be considered, if these ideas are to be anything other than interesting theoretical questions. How should writing be incorporated into varied subject matter areas, with students of differing levels of expertise in both writing and the content area? What sorts of training would be helpful for teachers, who are not themselves English language arts teachers, in making curriculum and instructional changes toward using writing for learning?

Such issues seem particularly important in the light of research on the use of study aids in reading comprehension (many of which involve writing, such as notetaking and outlining; see discussion in Brown, 1982). Such activities, as sensible as they seem, are not effective in and of themselves, unless students understand their purpose and receive assistance in assuming control of the activity as a strategy for regulating their own meaning-making efforts.

As will be discussed in the next section, knowledgeable teachers are needed to help students in the process of taking control. Efforts to refine our understandings of the connections between writing and learning should help place many recommended instructional strategies (e.g., journal writing, observational logs, research reports) within a conceptual framework, thus assisting teachers in making decisions about appropriate strategies for students across the grades and across the curriculum.

Adult and Peer Response to Writing. In teaching/learning settings, research should focus on the teacher/student conference and on response in peer groups. The concept of interactive conferences between students and teachers is appealing and its effectiveness has been described in observed classrooms (Calkins, 1983; Graves, 1983). We now need to work toward a theoretical framework that would allow us to understand the sorts of interactional supports that are helpful for individuals (Sommers, 1982). There remain basic questions about the type of help that should be offered in conferences. As Scardamalia and Bereiter (1986) argue, we do not know in which situations teachers might best focus on the specific content of students' writing, helping them become more

aware of their goals and major ideas (Graves, 1983; Newkirk & Atwell, 1982), or when it would be more profitable to provide nonspecific support focused solely on students' strategies (as in procedural facilitation). We also need to explore the appropriateness of varied types of response for students with differing levels of knowledge about writing and with differing styles of working. As Cazden (1979) points out, the whole notion of instructional scaffolding is, after all, that the scaffold self-destructs as the learner develops and is then replaced by more elaborate scaffolds.

Furthermore, students in our schools come from differing social and linguistic backgrounds and may have differing notions of comfortable ways of communicating (Brooks, 1985; Heath, 1983; Labov, 1972; Michaels, 1981; Philips, 1972). We need information, then, that might help us understand how to vary conferences so as to more effectively support students from non-mainstream communities.

We also have little understanding of how peer response to writing can be used most effectively in classrooms. We need to know how peer response groups should vary for learners with differing levels of skill, with differing styles of learning, and differing notions of interactional comfort.

Further, peer response groups raise many questions about authority and social roles that must be addressed (Freedman, 1985a). In other areas of the curriculum, as well as with culturally and linguistically diverse students, such complexity has been dealt with most successfully through new patterns of supervision, including delegating of authority, establishing a clear system of norms for behavior within the working group, and close monitoring of outcomes through increased teacher/student communication (Cohen et al., 1979). Without such changes, students' attention tends to waiver, learning drops off, and discipline problems increase. Questions of authority roles and relationships in peer groups are complicated further by the existence of students' own social networks of roles and relationships (Dyson, 1985b; Freedman & Greenleaf, 1985). Peers assume an increasingly important role during the school years (Corsaro, 1985; Labov, 1982), and thus issues of how students' nonacademic lives and academic lives interrelate must be addressed.

Computer Response to Writing. The characteristics of the computer suggest its potential as a learning environment and raise questions about the extent to which the kinds of responses that are provided by teachers and peers can be provided through interactive computer technologies. The most interesting applications of technology to writing instruction will probably be those that make new activities possible, rather than simply facilitating old approaches. For example, with a large enough screen, it is possible for a teacher and a class to study and edit writing collectively and collaboratively. Hess (in progress) has found that such uses of computers in classroom settings lead to more group problem solving and a greater range of oral language activities.

Beyond these opportunities posed by the computer itself, it will be important to attend to how schools can best take advantage of the new technology. Teachers will need appropriate training in the creative use of these new tools.

Finally, in this area of response, as in previous ones, the appropriateness of varied formats for students of different levels of skill, stylistic preferences, and concepts of interactional comfort must be explored.

AREAS FOR FUTURE RESEARCH

Introduction

The research we have discussed provides an impressive beginning for a working model of writing as a social-cognitive process. Although much of this new knowledge is tentative and in some cases controversial, we have an expanded sense of writing as a product and process within its social context.

We know about written products through methods of analysis, drawn largely from the traditional methods of rhetorical and literary analysis and from recent work in discourse analysis and theory. We have new insights into the cognitive processes in which writers engage and are beginning to understand the special demands of such cognition, including the intricacies of invention and revision, the complexity of a recursive process, and the challenges of managing such a thought process. And we are beginning to sketch out a repertory of strategies for planning, discovery, and learning, for language production, and for evaluation and revision, that anticipates the responses of readers.

Finally, we are beginning to understand how writers operate within social contexts; that is, research has moved beyond an awareness of the crucial fact of context to develop exciting profiles of how people use written language, of how different discourse communities operate, and of some of the hurdles a learner must leap to enter into a new community. Such hurdles may be faced as learners move from home to school, from elementary to secondary classrooms, from secondary school to the university or the workplace.

We believe these are impressive achievements. They have produced a working model of writing that offers a coherent and rich guide not only for an informed practice but also to further inquiry. How, then, can we respond to these developments? We at the Center for the Study of Writing (CSW) believe that a plan for significant new research is essential to the vitality of research in writing and that this research must work to build new bridges between research and teaching.

We think it will be fruitful to examine the teaching and learning of writing at several key transition points: (a) the transition from home to school, (b) the transition from elementary to secondary school, (c) the transition from secondary school to the university or (d) to work, and (e) the transition from the university to the work world.

Program Area 1: Writing and the Writer. The primary question to be addressed by CSW researchers in this area is, *what strategies and knowledge do students bring with them to writing that lead them to more or less successful experiences as writers?* Within this area, research is seeking to understand the writer and at the same time to consider how teachers can use this knowledge about variation in students' knowledge to help all students learn. The research is guided by both educational and theoretical goals. The social-cognitive theory of writing discussed in our presentation of the intellectual foundations for future research has given us an exciting if still partial picture of writing as a social and cognitive act. In the long run, education will be served best by research which expands our picture of the cognitive and social processes this rich practice entails.

We are conducting research that will confront two questions of real theoretical significance for social-cognitive theory building. Dyson (in progress) explores the emergent writing of young children, a process which reflects a logic and a constructive effort by the child but a process which the teacher may fail to understand. She is focusing on how children's writing is supported by their use of other symbolic media (drawing and talking) and also by their social interactions with each other. Flower and Hayes (in progress) will investigate the strategic and procedural knowledge writers bring to complex academic writing tasks which involve reading as a basis for writing (reading-to-write) and which involve an information search both in outside sources and in one's own mind.

These projects initiate a key theme, namely how do students interpret and use our instruction about how to write? As active constructors of meaning in response to assignments and advice from teachers and peers, students must represent each writing task to themselves and must translate instructions into actions. The preliminary research in this area suggests that making meaning out of a task has a powerful, but often unseen effect on students' performance.

Program Area 2: Writing and Instruction. The primary question to be addressed by CSW researchers in this area is, *how does instruction affect students' writing and learning?* That is, in what ways does teaching modify students' knowledge and strategies, add to their repertory of options, allow transfer, or help them achieve greater meta-cognitive control of their own knowledge and abilities? CSW projects focus on students who are moving from elementary to secondary instructional contexts and on students who are making the transition from secondary school to job training programs.

Freedman (in progress) is examining a key aspect of the teaching of writing that has both cognitive and social import--response to student writing. Building on her past research, she is examining the knowledge of expert practitioners and is looking closely at the kinds of small group collaborations that help writers most. She plans to combine practitioner knowledge with knowledge gained through research to set up model classroom response environments that contribute to student performance. Her studies take a cross-cultural perspective and examine the teaching of writing in England and the United States. Ammon and Ammon (in progress) are examining students' writing in science to determine how writing reflects and supports the learning of science. Cook-Gumperz is studying how writing is taught in postsecondary school job-training programs. These CSW projects focus on the study of the cognitive skills that writing teachers teach and the social-cognitive environment needed to foster those skills.

These projects examining writing and instruction not only complement those focusing on writing and the writer, but also add a layer to the theme running through those studies. Here the concern is not so much on how students interpret and use instruction as on the social and cognitive conditions of instruction that support student learning.

Program Area 3: Interactions: Writing and Reading, Writing and Speaking, Writing and Computers. Three separate questions are addressed by research in this area: *how is writing affected by what one reads and by one's reading ability; how is writing affected by how one speaks; how is writing affected by access to computers?*

As a complex cognitive and social process, writing is the site of some large, highly visible interactions which include the interaction between writing and reading, between writing and speaking, between writing and computers. How do these important interactions affect performance?

We think it important to concentrate on these three areas of interaction because all the available evidence suggests they have a strong effect on the performance of the writer and because we believe that insightful instruction in these areas could make a significant difference. We consider each area, one at a time.

Reading and Writing. Reading and writing are reciprocal processes. First of all, writers must often start by interpreting and responding to others' texts. Good writing depends on good reading. Writing is also a way to learn from what one reads. The Flower and Hayes projects (in progress) study how the strategies students bring to the task of writing-to-learn influence how the potentially powerful interaction between reading and writing works. Indeed, the process itself of reading-to-write, explored in these projects, is both a critical and a creative process we are just beginning to understand.

Reading interacts with writing in other ways as well, some of which are being raised in other projects. Writers must read their own texts. How they read determines what they look for, what kinds of problems they detect, and what they revise. Writers must also respond to the reading of others--including the peers and teachers studied in Freedman's study of response.

Because of the importance and diversity of the interactions between writing and reading--the cornerstones of literacy--we have sponsored a project that will draw together information on these interactions. The project is being conducted in conjunction with the Center for the Study of Reading and will result in a book on writing and reading relationships. Through this project, we address such questions as: What similarities and differences exist between writing and reading? How does learning to read help one learn to write and vice versa? How do both writing and reading help learners in all areas of the curriculum? How do people of varied ages use writing and reading in the home and in the school? What historical forces have influenced how writing and reading are taught in the school?

Speaking and Writing. Writing takes place against a background of speaking. Humans have been speaking for hundreds of thousands of years, whereas until very recently very few of them have done much writing. Even today, speaking is an overwhelmingly more prevalent activity than writing. All normal individuals are capable of learning to speak with no instruction whatsoever; however, writing is usually taught deliberately. It is a skill that is learned with effort, and usually imperfectly.

Some research has already focused on the specific relationships between speaking and writing, and on the ways children's knowledge and adult's expert knowledge of speaking must be modified in writing. We are expanding these studies to develop a more detailed understanding of the interaction between these two kinds of language. Chafe (in progress) is examining the on-line production of written language, focusing on how both writers and readers assign prosody--intonations, hesitations, and other prosodic features to written language. Such study will contribute to our knowledge of how writers manipulate written language to communicate intentions and will also yield implications for how instruction can support these processes.

Computers and Writing. Computers are a new tool for the writer that may also make significant changes in the process of writing. However, it should come as no surprise that evidence to date suggests that the important changes depend first of all on whether the learner possesses the writing strategies for invention and revision that make use of this flexible new tool.

Computers also promise to offer us effective ways to handle some kinds of basic writing instruction and to free teachers to handle harder tasks. Furthermore, innovative approaches to computing and writing hold the promise of even more sophisticated tools which support and encourage a mature writing process. Research is needed to investigate how computers can support the instructional process at various levels of sophistication.

CONCLUSION

Writing as a field has emerged through the combined efforts of teachers, researchers, and other scholars working from diverse theoretical perspectives and with varying methodological tools. From this multifaceted effort has come a multifaceted view of writing itself. Indeed, those who make pronouncements about "writing" in the abstract are on dangerous ground, for writing, as product and process, is shaped by and shapes a social context, a context that includes the nature of the particular task, the roles and interactions of the people involved, and the wider social and organizational structure. We see the need, then, to work towards an integration of research on writing, an integration that seeks to illuminate the intricate web linking process, product, and context.

To this end, we suggest a new orientation to research, one that emphasizes neither process, product, nor context, but learners and teachers. We want to understand the literacy demands learners encounter across time and space as they progress from home to school to university and workplace; we aim to identify more completely the resources learners have to draw upon to meet these ends and the resources teachers have as well as they seek to mediate between the learners and the ends. Thus, although we have reviewed research in the traditional areas of context, process, and development (much of which traditionally focused on product), we propose program areas that focus on teaching and learning. For as educators--whether our dominant function is as teacher, researcher, administrator, or some other role--we are united in our concerns for students, our commitment to teaching, and our desire that our work contribute to the education of future generations.

Footnote

1. This Technical Report is a slightly revised version of the Mission Statement from *A Proposal to Establish a Center for Study of Writing* submitted to the National Institute of Education by The University of California at Berkeley in collaboration with Carnegie Mellon University, March, 1985. In parts of the process of writing this Mission Statement, we worked closely with Arthur Applebee, Shirley Brice Heath, and Judith Langer at Stanford University. They deserve credit for their contributions to many of the ideas behind the Mission statement. In addition, we would like to thank Peg Griffin, Luis Moll, and Michael Cole of the University of California at San Diego for their assistance at many points in its development. Special thanks go to Dean Bernard Gifford at Berkeley, who not only made substantive contributions throughout the development of the proposal, but who also gave his full support, constant encouragement, and substantial help in putting the proposal together. Finally, we would like to thank Alicia Brass, Ernie Grafe, and Lynnette Harry for their assistance in producing this manuscript.

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